the Iron Age
A Chilton Publication
THE NATIONAL METALWORKING WEEKLY · JUNE 30, 1955

How will steel pay for wage boost?
See page 19

CMP *cold rolled strip steel processed to your own restricted specifications*

assures the lowest end product cost

If better working qualities, closely controlled physicals, close tolerances and uniform structure would help reduce your manufacturing costs, CMP can develop restricted cold rolled strip steel specifications for your particular fabricating requirements to enable you to enjoy these benefits. It is possible to impart qualities to CMP Strip Steel which can simplify operations and increase yield.

And, because of the normal dimensional precision of CMP Cold Rolled Strip Steel, you'll also enjoy a bonus of more footage per coil . . . more parts per pound, longer tool life, fewer shutdowns for coil replacement on automatic feed operations, faster assembly of component parts and a real opportunity for reducing your end-product cost.

When considering the real cost of your cold rolled strip steel, look to your end-product cost first . . . then specify CMP—made in carbon, stainless, alloy and tempered spring steel grades.

the Cold Metal Products co.
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PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, INDIANA
SALES OFFICES: Chicago • St. Louis • Los Angeles • San Francisco
New York • Cleveland • Detroit • Indianapolis

When you plan an electric furnace...

COMPARE COSTS PER TON OUTPUT

In these highly competitive times, we must be penny-wise *and* pound-for-pound-wise in figuring the costs of an electric furnace. Cost per ton of output is the wise way! So compute your costs by considering *all* factors! Here is why the Whiting Hydro-Arc Electric Furnace costs less *per ton of melt!*

(I) INSTALLED COST IS LESS because:

(1) the Whiting furnace foundation is simple
(2) it is completely assembled before shipment and shipped as fully assembled as practical
(3) cables are completely assembled
(4) all in-board wiring is finished and terminated at coded terminal blocks.

(II) OPERATING COST IS LESS because:

(5) electrode consumption is less
(6) electrode breakage is practically non-existent
(7) electrical energy usage for comparable operations is low
(8) top-charge, electrodes, furnace tilt and electrode clamps all operate quickly and efficiently
(9) transformer is designed to do the best job
(10) faster heats, more tons per hour

(III) MAINTENANCE COST IS LESS because:

(11) fewer working parts
(12) conveniently arranged working parts
(13) roofs are interchanged in 15 to 30 minutes
(14) refractory costs are at least 15 per cent less
(15) top-charge always in alignment
(16) all parts exposed to excessive heat are amply water-cooled
(17) smooth hydraulic operation of electrodes, furnace tilt, roof lift, and swing

So when you are buying an electric furnace, consider installation, operation and maintenance costs, quality of product and speed of operation. You'll find that Whiting melts *cost less.* Let us prove it to you. Talk things over with a Whiting Hydro-Arc Engineer!

Learn the Facts

Write today for Whiting Bulletin FY-168, which gives more complete information on how Whiting Features keep costs down, production up!

WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Ill.

FEMA

Sizzling steak on a steel wire grill

In making their line of braziers, small tables, lamps and other specialties, Keystone Lamp Manufacturing Corp. is using various types of Bethlehem wire, including bethanized wire, electrolytically coated with pure zinc by our unique process, low-carbon bright wire, high-carbon spring wire, and other grades.

Keystone is making braziers by the thousands at its Slatington, Pa., plant, trying to keep up with the growing demand. These portable grills have a 16-in. steel bowl which is removable for table-top use. Its slow, even heat is ideal for charcoaling a juicy steak to sizzling perfection. And the solid bottom keeps ashes from dropping out.

Whatever you need in steel wire, you can be pretty sure that Bethlehem makes it. In addition to the standard grades we specialize in producing single-purpose types, each tailormade for a given application.

Our metallurgists and salesmen will work with you all the way, both in selecting suitable grades of steel wire and in helping you to get the most out of them. Often we're able to come up with a suggestion that turns a problem into a profit for our customers. Just write to us at Bethlehem, Pa., or at our nearest sales office.

This popular model of "Bar-B-Bowl" has hinged legs for easy folding, a removable bowl and adjustable wire grill. Its slow, even heat charcoals a steak to perfection.

This attractive goose-neck desk light is one of many styles of lamps made by Keystone. Bethlehem wire of triangular section is used in making the goose neck.

The sturdy grill, welded from Bethlehem wire and nickel-plated, rests on wire legs and can be reversed for faster broiling. The bowl, legs, and other parts of the brazier are formed from Bethlehem cold-rolled strip.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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BETHLEHEM STEEL

BETHLEHEM STEEL

the Iron Age

Vol. 175, No. 25, June 30, 1955

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NEWS DEVELOPMENTS

HIGHER STEEL PRICES PAY FOR WAGE BOOST—P. 19
There's no getting away from it: steel wage increases must be paid for by higher steel prices. But raising prices is no simple matter. Producers must consider reaction of a variety of publics. They also must think about their own profit picture and the problem of financing more expansion by attracting risk capital.

HAVE WE TOO MANY PLANTS AND MACHINES?—P. 27
In terms of pre-depression trends, we are short of capital goods today, particularly plants. Capital goods spending has been high since 1945 but hasn't made up for wartime and depression lags. Present expansion and replacement rates figure to hold or accelerate. Which means we will put at least $384 billion into new plants and equipment over the next 10 years. Total will probably run higher.

U. S. OFFERS TECHNICAL DATA TO INDUSTRY—P. 28
The government spends $2 billion a year on research and reports dealing with industry problems. Reports tell how to save money, solve production problems, turn out new products. They are available at nominal cost. The metalworking field gets good coverage.

PLYMOUTH HAS LARGEST ASSEMBLY LINE — P. 36
Main plant facilities are capable of turning out three cars a minute if pushed to capacity. Miracle of scheduling makes it possible for plant to run without storage space as such. More than 70 freight cars and hundreds of trucks unload materials. Optimistic Ford and GM schedule more auto production in race for new markets.

WASHINGTON WORRIES ABOUT SMALL BUSINESS—P. 41
GAW has added to Capitol concern over the plight of small firms. New wage trends are seen demanding great financial reserves and making size even more of a must for economic survival. Many small firms have the choice of merging, selling out or going under.

MACHINE TOOL SALES HIT 21-MONTH HIGH — P. 47
Machine tool new orders jumped to over $72 million in May. The spurt, which brought sales to a post-Korean peak, came when buyers reacted strongly to word of a coming price increase. They raced to beat new price deadlines. May shipments showed only a small rise. More price increases are due in September.

IN METALWORKING

ENGINEERING & PRODUCTION

PLATING MACHINE ANODIZES MUCH FASTER — P. 59
An anodizing setup, based on a return-type electroplating machine design, is turning out 12 times as much work as is normally done by manual processing. Coating uniformity and quality are considerably superior. Maintenance is negligible and the system requires a minimum of floor space in the plant.

HOW AND WHERE TO USE PLASTIC FIXTURES—P. 62
Laminated and cast plastic fixtures for welding and assembly are usually simple to make, offer important savings where conditions permit their use. Plastic tooling is lightweight and strong, requires a minimum of design and machining time. Fixtures are readily made to desired accuracy, and once formed, they retain their dimensional stability.

"UNDERSTANDING" TITANIUM HEAT TREATING—P. 65
A simple analysis of the metallurgy of titanium alloys is of major importance to the titanium fabricator. It allows him to make better use of these alloys in the heat treated condition. Understanding the behavior of these alloys, their susceptibility to "omega" embrittlement, is important in hot forming and heat treating. This article tells "why" in understandable terms.

SUBMERGED ARC UNITS WELD LONG SEAMS — P. 70
Automatic and semiautomatic submerged arc welding had a major role in constructing eight giant grain storage bins. The project involved more than 125,000 ft of welding in the field-erected structures. Horizontal seams were made with automatic equipment mounted on self-propelled cages.

HANDLING SYSTEM SPEEDS TV ASSEMBLY RATE—P. 72
Handling methods and equipment specially designed for TV set assembly allow Sylvania to turn out more than 1400 completed sets per day. Three overhead conveyors, moving belt assembly lines, and air lifts to raise and lower the sets—all combine to keep this plant humming. A color coding system used in loading conveyors helps parts to arrive on schedule.

MARKETS & PRICES

RAILROADS RUSH NEW FREIGHT CAR ORDERS—P. 22
After months of hesitation, railroads finally place big car orders. Secrecy of purchasing plans was prompted by steel shortage. Over 50,000 new cars may be ordered in June. Car builders are warned that order backlogs within 60 days won't be completed this year. Backlogs for 1956 are assured. Heavy scrapping of cars but no new orders in 1954 left roads with 40,000-car shortage.

ELECTRICAL STEEL MOVES WITH POWER PUSH—P. 24
Electrical steel shipments are moving toward 1953's record 820,069 tons. The increase stems from growing power applications, home and industrial, and demand should continue to rise. These specialty steels will probably never become real volume items but they are finding a solid, rising market.

WILL PLASTICS REPLACE STEEL IN TRAILERS?—P. 26
The plastics industry is making a determined bid for the truck trailer market. New plastic trailer bodies offer weight and space savings, are available in kit form. Plastics are making some headway but metals will hold dominant position in the big trailer market for years to come.

RAILROADS TIGHTEN SURGING STEEL MARKET—P. 103
The railroads are superimposing a big freight car program on the tight steel market. This means that any hope of relief for consumers and producers is virtually out the window for balance of the year. Hard-pressed mills are pulling out all the stops but demand continues to surpass production and shipments. Vacation and maintenance slowdowns will hurt output.

FREIGHT CARS TIGHTEN PRODUCT DEMAND — P. 104
Stepped up plans by the railroads for new freight cars will put an even tighter squeeze on producers for plates, shapes, bars, hot-rolled sheets, castings. Purchasing agents will find no solace at the warehouse level where demand is heavy for all products and is affecting all types of consumers.

NEXT WEEK:

VERSATILE AUTOMATIC CORE BLOWER MAKES MOLDS
Sand-resin cores and molds—shell or solid and weighing up to 20 lb—can be produced at high speed on a new automatic core blowing machine. Cores are formed and cured in a single operation, eliminating the need for baking. Simple to operate, the machine can be cycled from 50 to 90 times per hour.

HOW MUCH IS NOISE COSTING INDUSTRY TODAY?
Tightened state laws have focused attention on the problem of industrial noise. Some plants have had vital machines barred. Other noise effects are easier to ignore, may be more expensive. Next week's story will go into the whole question, discussing efficiency, regulations, remedies and outlook for work noise.

AJAXOMATIC POURING UNIT

In Operation at Montrose Division,

BENDIX AVIATION CORPORATION

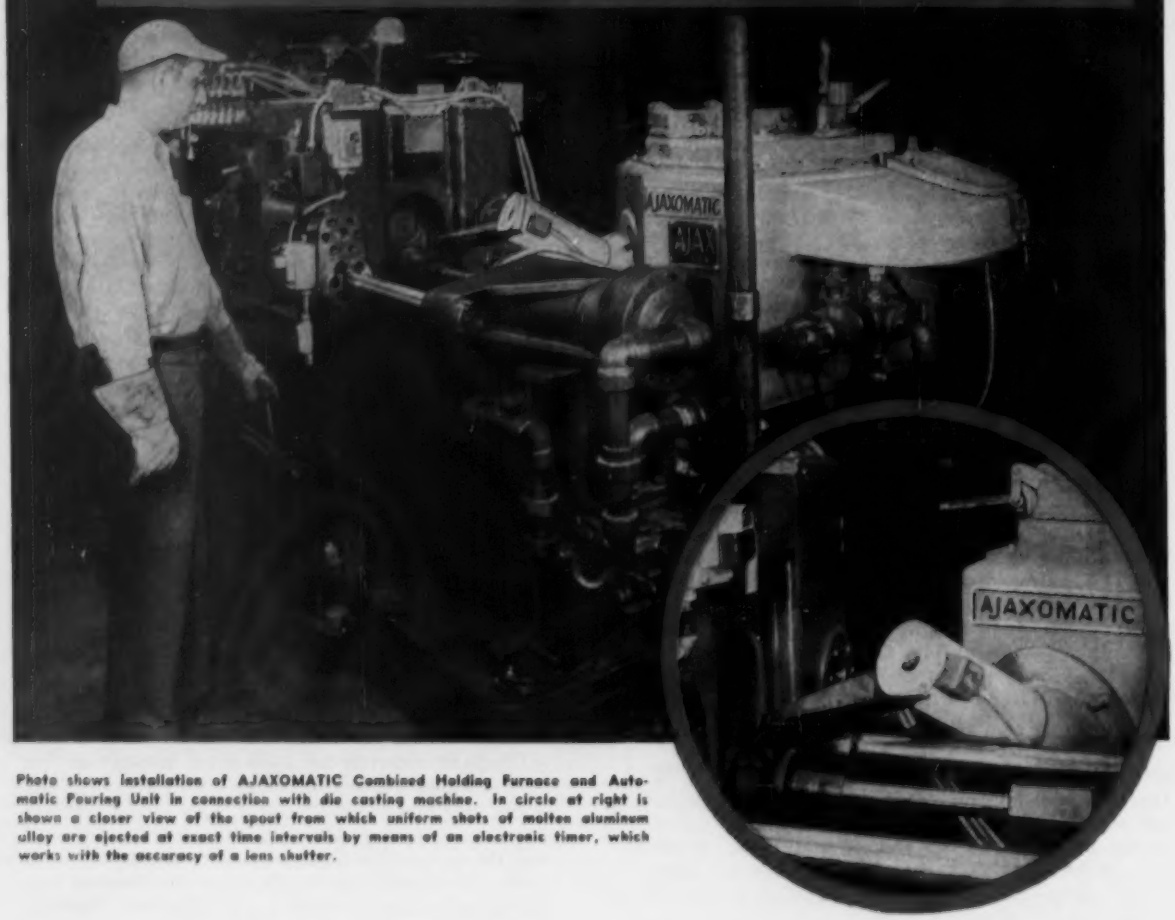

Photo shows installation of AJAXOMATIC Combined Holding Furnace and Automatic Pouring Unit in connection with die casting machine. In circle at right is shown a closer view of the spout from which uniform shots of molten aluminum alloy are ejected at exact time intervals by means of an electronic timer, which works with the accuracy of a lens shutter.

NOW completely automatic die casting of aluminum alloys is possible in smaller quantities than formerly, and at reduced cost. This fact should be of special interest to the manufacturer who has die casting machines in operation and is doing hand ladling. The unit is entirely sealed, the operator feels no heat, accident hazard is eliminated.

This small, compact AJAXOMATIC* unit will increase production of die castings by as much as 25%, because it delivers regular, uniform quantities of metal into the die casting machine with no delay, immediately after dies are closed. The spout itself is heated and the temperature of each metal shot remains constant.

*Trade Mark, Registered U. S. Patent 2,674,640 and Pending U. S. Patent Applications

For further information send for descriptive folder

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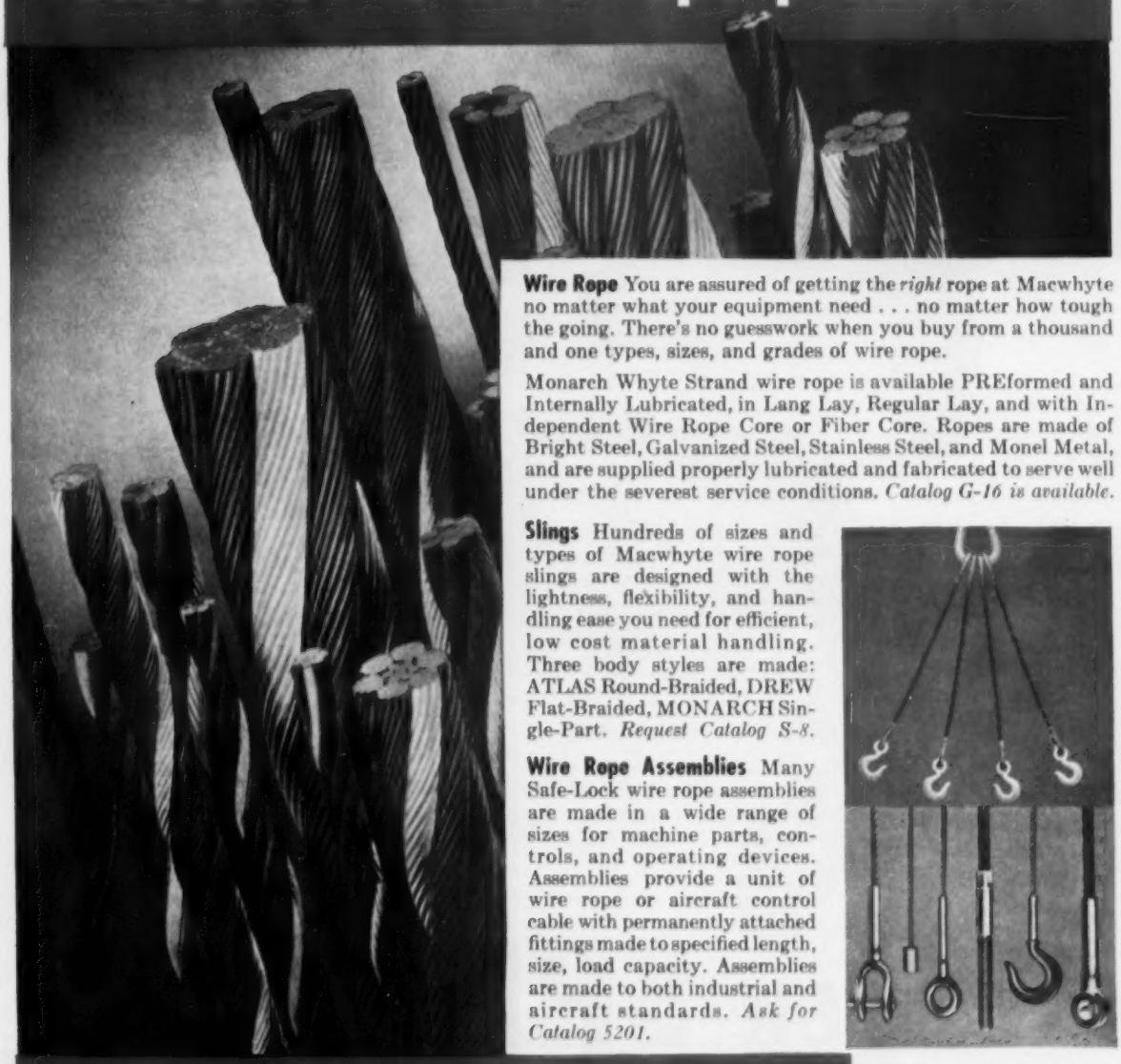

Wire Rope You are assured of getting the *right* rope at Macwhyte no matter what your equipment need . . . no matter how tough the going. There's no guesswork when you buy from a thousand and one types, sizes, and grades of wire rope.

Monarch Whyte Strand wire rope is available PREformed and Internally Lubricated, in Lang Lay, Regular Lay, and with Independent Wire Rope Core or Fiber Core. Ropes are made of Bright Steel, Galvanized Steel, Stainless Steel, and Monel Metal, and are supplied properly lubricated and fabricated to serve well under the severest service conditions. *Catalog G-16 is available.*

Slings Hundreds of sizes and types of Macwhyte wire rope slings are designed with the lightness, flexibility, and handling ease you need for efficient, low cost material handling. Three body styles are made: ATLAS Round-Braided, DREW Flat-Braided, MONARCH Single-Part. *Request Catalog S-8.*

Wire Rope Assemblies Many Safe-Lock wire rope assemblies are made in a wide range of sizes for machine parts, controls, and operating devices. Assemblies provide a unit of wire rope or aircraft control cable with permanently attached fittings made to specified length, size, load capacity. Assemblies are made to both industrial and aircraft standards. *Ask for Catalog 5201.*

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Macwhyte Company, 1911 Pershing Avenue, Kenosha, Wisconsin. Manufacturers of: Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies.

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Sharon, Pennsylvania

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BPA NBP

Editorial:

The Shoe Is On Whose Foot?

◆ NOT TOO LONG ago top government people told us the Russians were well behind us in the aircraft race. Now we know that isn't true. They are probably ahead of us in some areas.

We thought that once we were strong we "could lead from strength" in our dealings with the Communist world. That has been our goal. It is the only reason for talking about peace the way we have in the past several months.

You can't talk peace with the Russians or the Chinese Reds unless you are prepared to back up your talk with strength—military strength. We should know this by now.

But are we still leading from total strength? There is some doubt that we are. The shoe may be on the other foot. The Reds are telling their people they must beware of a "surprise attack." Russians are being told the facts of nuclear warfare. Defensive psychology in Russia is being belittled. This talk could be ominous for us some years hence—it could be their program.

Already, despite the warnings from President Eisenhower, there are too many people in the free world who think the Reds are serious about "love thy neighbor." It is hard for many Americans to see things other than by their own standards of conduct which are decidedly not those of the Communists.

We have muffed the military reserve plan so far. By the skin of our teeth something akin to the Administration's reserve program may go through Congress. But that does not excuse the President's advisors from their blunder. The reserve setup should have been approved well before the cut in the armed forces was okayed. You can't chance having one without the other.

We need a new look at our whole defense program. While Congress is at that it might look a little deeper into our chances for stark survival in case of a surprise H-bomb attack.

Also we might search our collective conscience mightily as we ask ourselves the blunt question, "Is our attempt to balance the budget unduly (or unconsciously) influencing our defense policy?"

Is the Russian shoe on our foot?

Tom Campbell

EDITOR

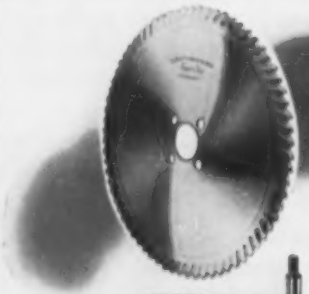
STEP UP Metal-Sawing Production in ALL of 7 ways:

• *The New No. 2-8 Automatic Motch & Merryweather Circular Sawing Machine.*

1. LESS TIME
2. LOWER TOOL COST
3. MILLED FINISH
4. BURRLESS ENDS
5. NEGLIGIBLE WASTE
6. PERFECT PARALLELISM
7. ACCURATE LENGTHS

THE MOTCH & MERRYWEATHER Triple-Chip METHOD DOES JUST THAT!

CAN YOU EQUAL THIS { TIME / COST } BY ANY OTHER METHOD?



Material — 3" dia. SAE 1020
Cutting time — 84 seconds
Tool cost per piece — $ .019
IMPORTANT: Re-sharpening costs and all other tool costs are included.

ALWAYS—*it's your cost per cut that counts.* To determine that cost, all seven yardsticks listed above must be applied. You must increase usable production, get uniform accuracy, and reduce sawing costs. The Motch & Merryweather Triple-Chip Method out-performs and out-saves all others in the sawing of metal. Let us convince you.

THE MOTCH & MERRYWEATHER MACHINERY CO.

MACHINERY MANUFACTURING DIVISION
CLEVELAND 13, OHIO

Builders also of Production Milling, Vertical Turning, Automatic and Special Machines

dear editor: *letters from readers*

Does Your Customer Like You?

Sir:

Your editorial (Does Your Customer Like You?) in the June 9 issue, is one of the finest pieces of writing that I have had the opportunity of reading. Your presentation of facts are so true. Let us hope that everyone that reads this article does just what you say.

The real point of this letter is a request so that others may also read this fine editorial. We ask your permission to copy this to send along to our dealers. Paragraph four has a real kick in it and many of our dealers will profit by this.

We also consider IRON AGE as tops in trade journal media. Again, congratulations on a wonderful editorial. *R. S. Wahatalo, Industrial Bench & Equipment Mfg. Co., New Britain, Conn.*

Censorship

Sir:

Your editorials are always very interesting and informative.

I always feel a sense of gratitude for the time and effort which people like you spend, to say nothing about the barrage of criticism which you probably have to put up with, all in the ultimate interest of the average citizen and taxpayer such as myself.

You know they say that "those who dare to teach or lead must never cease to learn" and I know you must spend a lot of time and thought to keep up with the changing conditions in these fast moving times.

By the very nature of things, some of your writings will be more forceful than the others probably because they deal with situations of considerably greater importance.

In this respect, it seems to me your May 19 editorial (Do You Want Thought Control?) is "loaded." You know, this idea applies not only to government but to private industry and private life as well. Few people realize, except for the appropriate action to guard trade secrets and processes which give a competitive advantage, that when the front, the side and the back door are closed, progress is actually locked out. Sooner or later that type of an individual or institution will find that they are projecting ideas about buggy whips which have no use in an automobile. We just cannot afford to stand still or retrogress—we must keep moving forward and we cannot do that by locking all the doors. *F. A. Knapp, Glenshaw, Pa.*

Titanium Alloy

Sir:

In your June 9 issue, in the Newsfront section, you mention a powder metal titanium alloy with small additions of aluminum as a strengthener to improve impact and endurance limit of titanium.

Would you please send me the name of the manufacturer and the analysis? *E. Gordon, Chief Metallurgical Engineer, Metal Hydrides, Inc., Beverly, Mass.*

Details may be obtained from Clevite Corp., Division of Brush Laboratories, 16800 St. Clair St., Cleveland 10, Ohio.—Ed.

Stainless

Sir:

Would you be kind enough to send us four or five tear sheets of the article which appeared on p. 43 of the June 16 issue entitled "Stainless: Where Are Its Markets?" *C. Galleciez, Rigidized Metals Corp., Buffalo, N. Y.*

For Ideas Unlimited...

consider a ball

Like everyone else who lives by "ideas," you, too, may now and then find yourself face-to-face with a blank drawing pad, wondering where your *next* idea is coming from . . .

Next time you are, think of a ball . . .

A Universal Ball.

You're likely to find *so many new ideas* hidden inside *just one* microscopic-size Universal Ball (to say nothing of the bigger ones) you'll have an idea backlog that will *never* run dry.

Fifteen years ago, for instance, who ever thought we'd be using a *ball* as a writing instrument? Well any day, now (perhaps *every* day), someone may design a product that's just as revolutionary . . . A product just as profitable . . . A product built around a Universal Ball—a ball that is *better than* 10-millionths of an inch accurate!

It *could* be *you*. And we'll be glad to help at the drop of a postcard.

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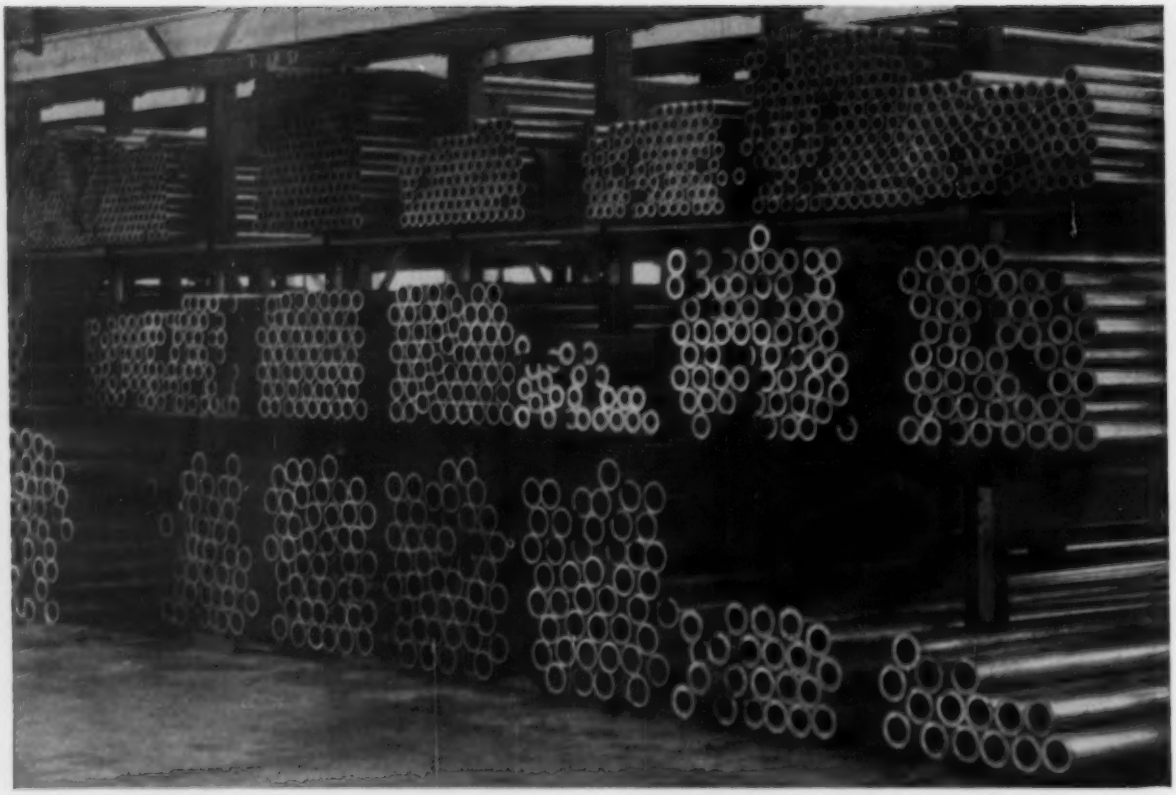
MONTGOMERY CO., PA.



What size 52100 steel tubing do you need? We'll ship tomorrow!

WE carry 101 different sizes of Timken® 52100 steel tubing in warehouse stock—from 1″ O.D. to 10½″. If you order today, we'll ship tomorrow!

52100 is a high-carbon chromium steel that will do most of your hollow parts jobs. In moderate sections it will through-harden and it has been used in place of more expensive steels. You can heat treat it to file hardness and then temper back to any desired point.

Timken 52100 steel is ideal for hollow-parts jobs like these: aircraft parts, ball bearing races, pump parts and plungers, collets, bushings, spindles, grinding machine parts and precision instrument parts.

The Timken Company is America's pioneer producer of 52100 tubing. We have a background of experience in making it that can't be equalled. We've developed rigid quality control procedures that check every step of the operation. Result: uniform high quality from tube to tube, heat to heat.

Write, wire or phone us now for immediate delivery of your less-than-mill-quantity orders of 52100. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

fatigue cracks

by William M. Coffey

Summer Reading

For your light summer reading on lazy days in the hammock, your government has once again issued its recommended "summer list." All the following are available through your government's printing office.

Travelers' Baggage Regulations of Belgian Congo and Ruanda-Urundi—many persons are ill at ease because they feel so "left out" on the subject of travelers' regulations in the Belgian Congo and Ruanda-Urundi. We are very happy to see that your government is acting to clear up this situation with this forceful book. You will be very happy to learn that "body linens and tooth brushes" are exempt from import duties. However, you may not carry a vehicle without the proper "triptyque" or a "carnet de passage en douane."

Manual of Instructions for Enumerators — this summer you are probably looking forward to making a housing survey for your local community or, if you're real lucky, for your government in Washington itself. If you are so fortunate, this delightful 106-page book is a "must." We all know that the role of an enumerator is a most enjoyable summer pastime, but it *is* exacting—and none of us should venture into such fun without a firm grasp of the fundamentals as outlined in Manual of Instructions for Enumerators. In detail it tells you for instance how to conduct an interview (*a memorized approach or speech is not desirable*) and how to proceed around a block (*begin at one corner of the block and walk around it*) and even how to count the number of rooms (*a bath is a bathtub*). By all means, write your Superintendent of Documents today.

Space Allocations for Grocery Items in Food Stores—this report is based on research. It tells why you should never, *never* put Wheaties next to Corn Flakes because one belongs to the American League and the other to the National League and the kids don't like it.

Care and Management of Bulls—if you're all out of bulls for the summer, get this one. It's full of bulls—bull lore, bull history, bull production. Just about everything about bulls you'd ever want. It's all about bulls.

Letters

Iron Age
100 E. 42nd St.
NYC
Gentlemen:

Yesterday we sent you a publicity release on the appointment of Mr. J. P. Beck as Asst. Manager of Engineering.

We would appreciate your destroying this release since Mr. Beck is no longer with this company.

Sincerely yours,

Puzzlers

We get 4.828 miles as the diameter of the walled-city puzzler (May 12, oops we're late with this 'un). And so did Charlsie and the bunch at Granite City; Arthur L. Milford, Fairfield Mfg. Co., Lafayette, Ind.; and Victor Vidoloff, an engineer at Roth Mfg. Co., Niles, Ill. Does this look right to you, Mr. Boysel?

New Puzzler

15 issues of Iron Ages are lined up in order on a shelf. The width of each is 1 inch including the covers which (let's say for fun) are ⅛ inch thick. How far is it from the first page of the first issue to the last page of the last issue?

Like to spend more time

reading and less

hunting? Turn to pages

2 and 3 of your

IRON AGE

EVERY week and let the

Digest of the Week in

Metalworking help

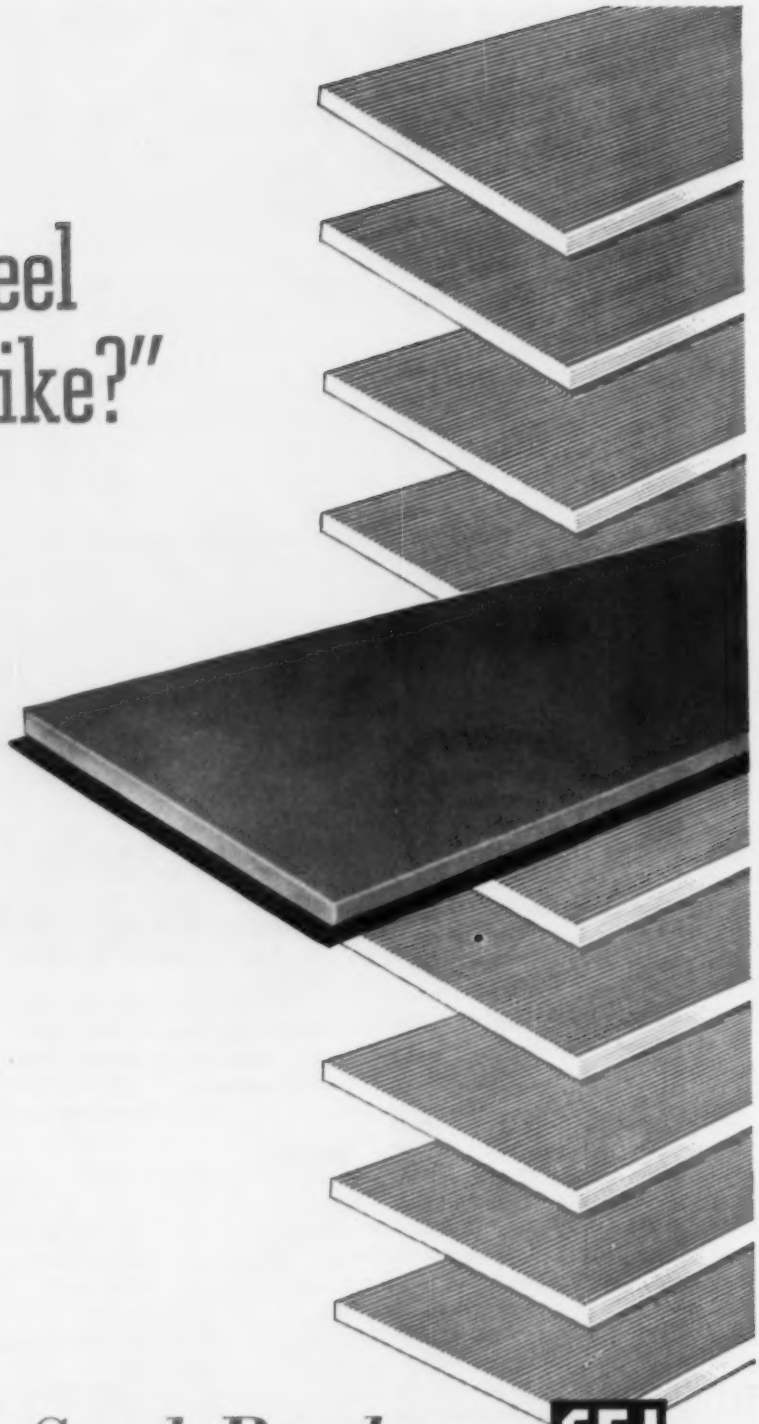
you find your favorite

features

IT PAYS TO READ

IRON AGE ADS TOO!

"aren't all steel plates alike?"



That's what some steel buyers think. But, take it from us at Claymont, it just isn't so! Or take it from the men in your fabricating shop. They know that—while many plates look alike—some are easier to work. They'll tell you, also, that Claymont plates save you money because your shop can do a better job.

You'll always find Claymont carbon and alloy plates among these preferred plates because they are tailored to your individual requirements. Right down the line your order gets personalized attention as it is processed through our sales office, checked by our metallurgists, produced by our skilled craftsmen, tested for proper physical and chemical properties by our laboratories and shipped to you *on time*.

TO ORDER—Contact our nearest sales office or write direct to Claymont Steel Products Department, Wickwire Spencer Steel Division, 813 West Street, Wilmington 99, Delaware.

Claymont Steel Products

CF&I

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dates to remember

JUNE

AMERICAN SOCIETY FOR TESTING MATERIALS — Annual meeting, June 26-July 1, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS — Summer general meeting, June 27-July 1, New Ocean House, Swampscott, Mass.

EXPOSITIONS

MACHINE TOOL SHOW—Presented by National Machine Tool Builders' Assn., International Amphitheatre, Chicago. September 6-17, inclusive. This is the first industry-wide showing since 1947 of the advances in machine tools.

JULY

NATIONAL HOUSEWARES AND HOME APPLIANCE MANUFACTURERS EXHIBIT — July 11-15, Auditorium, Atlantic City, N. J.

WESTERN PLANT MAINTENANCE AND ENGINEERING SHOW — July 12-14, Pan Pacific Auditorium, Los Angeles. Management: Clapp and Poliak, Inc., New York.

DROP FORGING ASSN.—Annual meeting, July 19-22, Grove Park Inn, Asheville, N. C. Assn. headquarters are at 605 Hanna Bldg., Cleveland.

TRUCK TRAILER MANUFACTURERS ASSN., INC.—Summer meeting, July 21-23, Detroit. Association headquarters are at Room 710 Albee Bldg., Washington.

NATIONAL JEWELRY FAIR—July 24-28, Conrad Hilton Hotel, Chicago.

AMERICAN TRADE ASSN. EXECUTIVES — Annual meeting, July 31-August 3, Grand Hotel, Mackinac Island, Mich.

AUGUST

AMERICAN SOCIETY OF TRAINING DIRECTORS — 2nd Annual Institute, August 7-20, Eagle Waters Resort, Eagle River, Wisconsin.

DENVER RESEARCH INSTITUTE—4th annual symposium on Industrial Applications of X-Ray Analyses, August 11-12, University of Denver, Denver, Colo.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS — Pacific General Meeting, August 15-19, Butte, Montana.

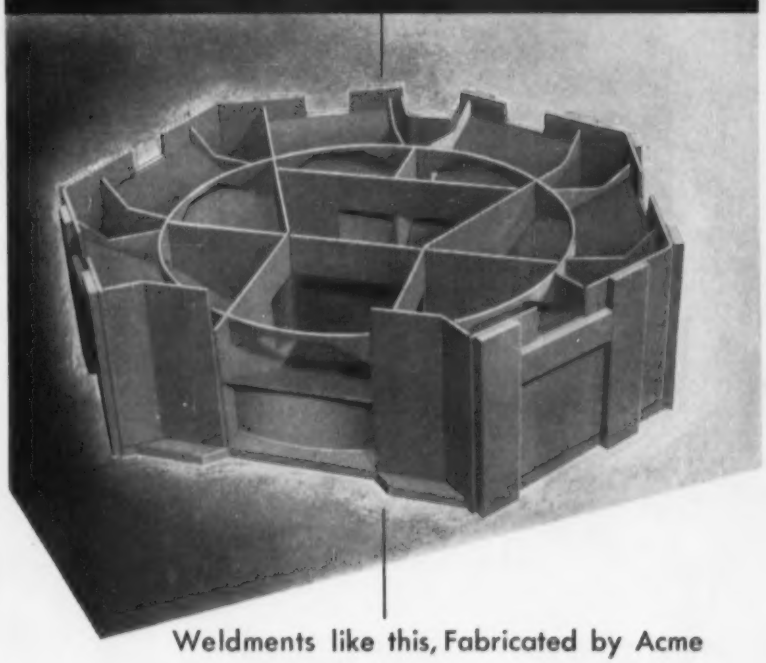
NATIONAL INDUSTRIAL CONFERENCE BOARD AND STANFORD RESEARCH INSTITUTE—National symposium on current "Electronics and Automation Production," August 22-23, San Francisco, California.

WESTERN ELECTRONIC SHOW AND CONVENTION — August 24-26, Civic Auditorium, San Francisco, California.

NATIONAL ASSOCIATION OF FURNITURE MANUFACTURERS — August 28-September 1, Conrad Hilton Hotel, Chicago. Showing on new products and ideas.

GENERAL MOTORS — Powerama, August 31-September 25. South Lake Shore Drive, adjacent to Soldier Field, Chicago.

ANOTHER MACHINE TOOL BASE THAT "couldn't be welded"



Weldments like this, Fabricated by Acme excel in Strength, Rigidity, and Precision Finish . . . save Weight and Cut Costs. No Design is too complicated . . . not even Yours!

In Doubt? Ask for Bulletin B-3
"The Facts about Weldments and Castings"

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DIVISION OF THE UNITED TOOL & DIE CO.

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A.S.M.E. U68-U69 Qualified Welders • A.P.I.-A.S.M.E. Approved
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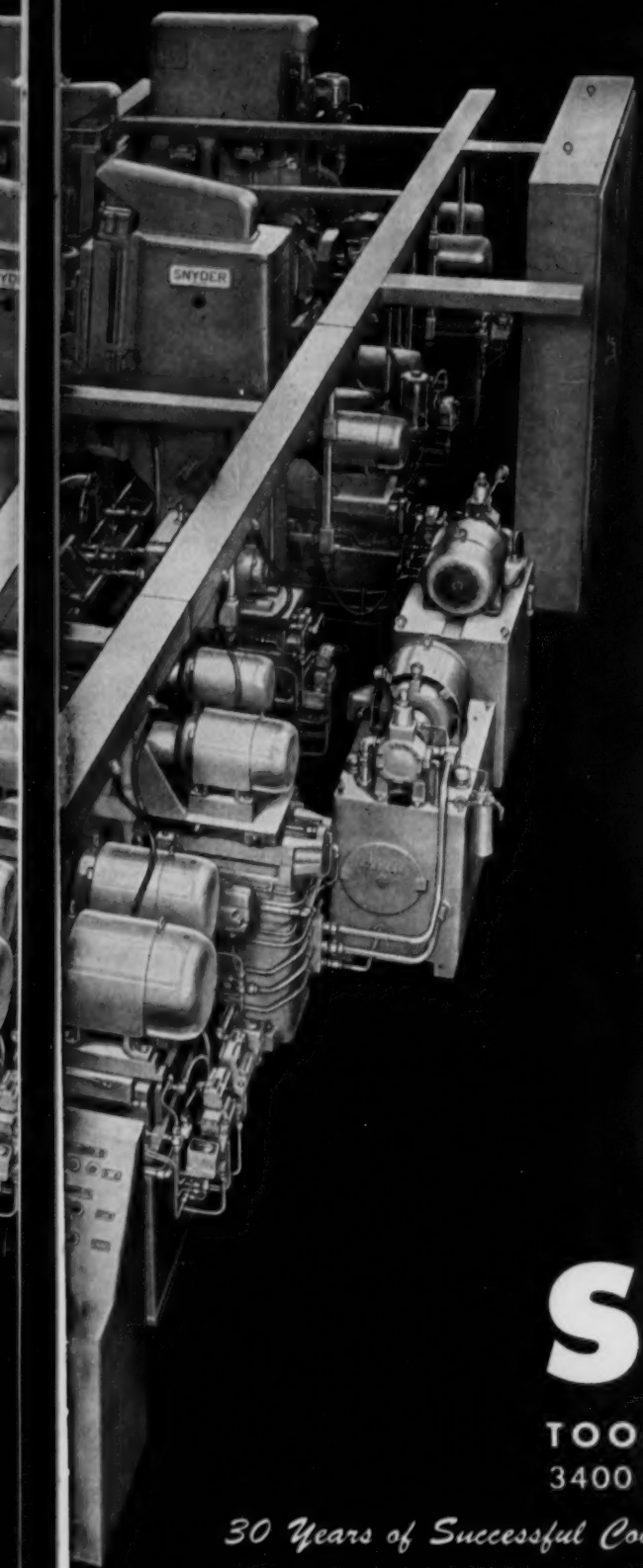
National Board Approved • Hartford Steam Boiler Inspection Service

STEEL STAINLESS STEEL EVERDUR ALLOYS

SNYDER—AUTOMATION

At Station 16, work piece is turned 90° and transferred to other rails without vibration or loss of precision locating.

LEADER FOR 30 YEARS



Presents

SNYDER SPECIAL

22-STATION automatic transfer machine for processing cast iron clutch housings; which drills, rough and finish bores, mills, saws, taps, spot-faces, counterbores and chamfers, performing a total of 110 operations on various surfaces or holes of various dimensions. Production, 124 cycles an hour at 80% efficiency.

UNUSUAL FEATURES: At Station 1, a 2" breather hole is trepanned from solid metal and finish bored with one tool. At Stations 8 and 9, a section of transfer rails cam-linked to milling units, drops to bring work piece into line with cutters. At Station 16, work piece is turned 90° and transferred to other rails without vibration or loss of precision locating.

SNYDER

TOOL & ENGINEERING COMPANY
3400 E. LAFAYETTE, DETROIT 7, MICHIGAN

30 Years of Successful Cooperation with Leading American Industries

this CINCINNATI PRESS BRAKE

is giving accurate and versatile performance at

UNITED STEEL FABRICATORS, Inc.

With ample capacity, this powerful 500 Series Cincinnati Press Brake with 18' 6' clearance between housings and 22' die area—handles formed structural bridge flooring, guard rails, steel doors, Girders, and side walls for various types of metal buildings are also produced.

United Steel Fabricators, Inc. are pleased with the accuracy in forming and ease and speed of operation which are important factors in this economical production.

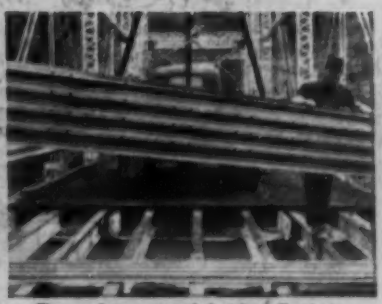
INVESTIGATE:

—Cincinnati Center Line Loading

—Cincinnati Interlocked Construction

—Cincinnati Rigid Deep Beds and Rams

Write for the latest Press Brake Catalog B-4.



Formed structural bridge flooring

Barrier beam guard rail formed to any radius desired

Photos courtesy of United Steel Fabricators, Inc., Wooster, Ohio

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

Permanent yet portable steel building

The Iron Age Newsfront

Alpha Phase Ti Extrusion Stronger

Unalloyed titanium bars extruded in the alpha-phase region (1450° and 1600° F) exhibit higher yield and ultimate strengths than bars in the beta phase region (1750° and 1900° F) recent studies indicate. Average ultimate strengths of 85,000 and 70,000 psi respectively, as extruded, are reported. Annealing for 1 hour at 1500° F and air cooling did not change tensile properties.

Plastisols: Appliance Makers Interested

Plastisols applied by spray techniques may soon find their biggest market in the home appliance field. Tests are now under way on pilot lots of equipment. Available in virtually any color, the coatings have already shown a 7-year service life in laboratory tests.

Order Hybrid Stationwagon for Desert

Special stationwagons with a Plymouth body and a Dodge hood and grille, have been ordered by Arabian Oil Co. for overseas use. Special 9.00 x 15 tubeless tires will be used on the station wagons to give better traction in the desert sand.

Build Earth Movers On Assembly Line

Assembly line production of some heavy earth moving equipment will soon be used by one manufacturer. Eight specially designed trailers will be used for what is believed to be the largest equipment ever produced using the assembly line technique.

Automatic Truck Transmissions Favored

First reports on automatic transmissions in trucks are promising. Indications are that automatic transmissions will be used more and more in trucks and passenger cars in the years ahead.

New Pentagon Listing Soon Ready

The Pentagon's new *"Alphabetical Register of Planned Wartime Materiel Suppliers"* will be 10,000 names shorter than the earlier version. While not open for general inspection, a producer may find if he's listed by checking with major procurement offices, such as ordnance district headquarters.

Stiff Price for Small Odd Lots

Odd lots of steel freed as a result of production and design changes are being offered for sale throughout the country. While the tonnages are usually small, hard-pressed customers are happy to get them. Transactions are generally handled by steel brokers, and the customer pays a stiff price for what he gets.

Capital Goods: Export Finance Relief

Some relief in obtaining long term financing for export of heavy goods to South America may be in the wind. The Export-Import bank may be modifying its position while formation of banking syndicates for this purpose is already in progress.

Checks Coating Thickness Quickly

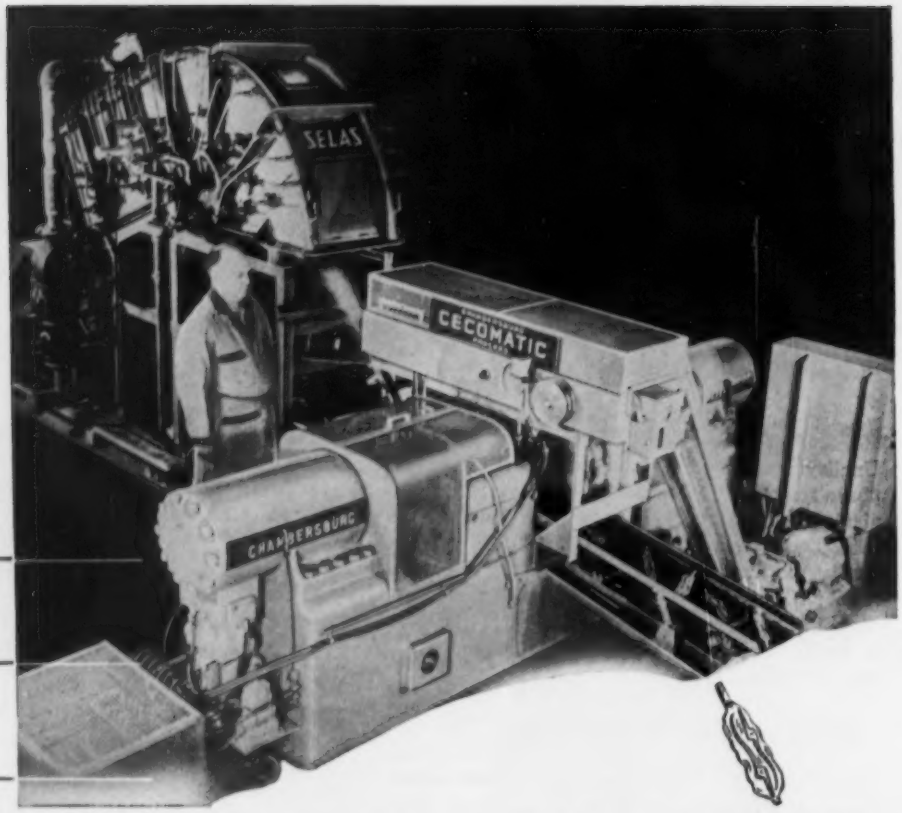
Virtually any coating on any base material can be checked for thickness nondestructively with a new instrument. The unit permits quick, easy, direct readings for complete inspection of production items. It can be used to measure metallic, ceramic, plastic, anodized and painted coatings.

Wider Use of Vacuum Metallizing Seen

Vacuum metallizing of aluminum is expected to play an important part in future automotive trim. Costs are favorable and many beautifully colored finishes can be produced.

NEWSFRONT · NEWSFRONT · NEWSFRONT · NEWSFRONT · NEWSFRONT

$1 per thousand for



....HEATING for AUTOMATIC FORGING

...with Selas Thermo-Automation

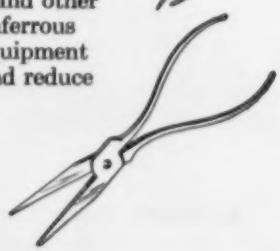
Forged pliers, scissors, wrenches, shears, turbine blades and forceps are typical parts manufactured by Chambersburg Engineering Company's new Cecomatic Process. Forgings weighing from a few ounces to hundreds of pounds can be produced with this automatic technique.

In forging pliers, for example, Selas high-speed heating automatically furnishes 9/16 x 9″ bar stock at 2100°F to the Impacter, to permit production rates of up to 1000 forgings per hour. Total fuel and power costs of the furnace are less than $1.00 per hour.

Virtual elimination of scale . . . reproducible heating uniformity from piece to piece . . . compact equipment . . . work size flexibility . . . operator comfort . . . are other features of Selas heating.

In heat treating, brazing, forging, strip annealing, and other continuous operations involving both ferrous and nonferrous metals, Selas Engineers can design heat processing equipment to help speed production, improve product quality and reduce manufacturing costs.

Write for descriptive data concerning your heating requirements.



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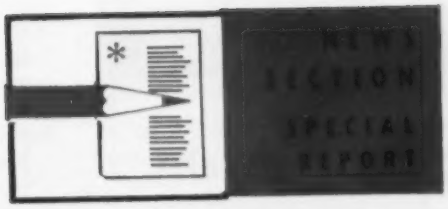
CORPORATION OF AMERICA
PHILADELPHIA 34, PA.



STEEL PRICES: They're Everybody's Business

Steel producers have a lot to think about before they boost prices . . . That's why price increases tend to be moderate . . . Government concern over inflation important . . . Competition a factor—By J. B. Delaney.

◆ THIS YEAR will be no exception. The steel wage boost will be paid for by higher steel prices.

Amount of the wage boost (see p. 21) has a lot to do with how much steel prices rise. But there's more to it than that. Before they set new prices, steel producers have to consider (1) public reaction, (2) their own profit picture, (3) financing of new capacity and modernization, and (4) competition within the industry and from other metals and materials.

Steel's "public" includes just about everybody — its customers, the "man in the street," and government. It's sensitive to the reactions of all of them.

It's no secret to steel people that the Administration is worried about inflation. Government officials have indicated they consider the threat of an accelerated inflationary spiral one of the biggest threats to economic stability.

Technology Affects Earnings

That's why the amount of a steel price increase is more than a matter of simple arithmetic to the steel companies. And it's also the reason why average price boosts tend to be barely enough to offset the amount of the increase in labor costs.

In sizing up steel's profit picture, some observers are inclined to overlook the effect of technological advances toward offsetting steadily rising labor costs by reducing production costs. This year's pay increase—as in the past—will be followed by even greater emphasis on improved facilities and automation.

Also, the industry has learned a lot about its production costs since the first steel labor contract was signed in 1937. Its prices are based on the cost of production plus a reasonable profit. This wasn't always the case. It used to be that some products were sold at a loss, or at best a slim profit.

Another fact of life steel companies have learned is that an increase in their own employment costs triggers an inflationary spiral that boosts the cost of other goods and services they buy by at least an equal amount.

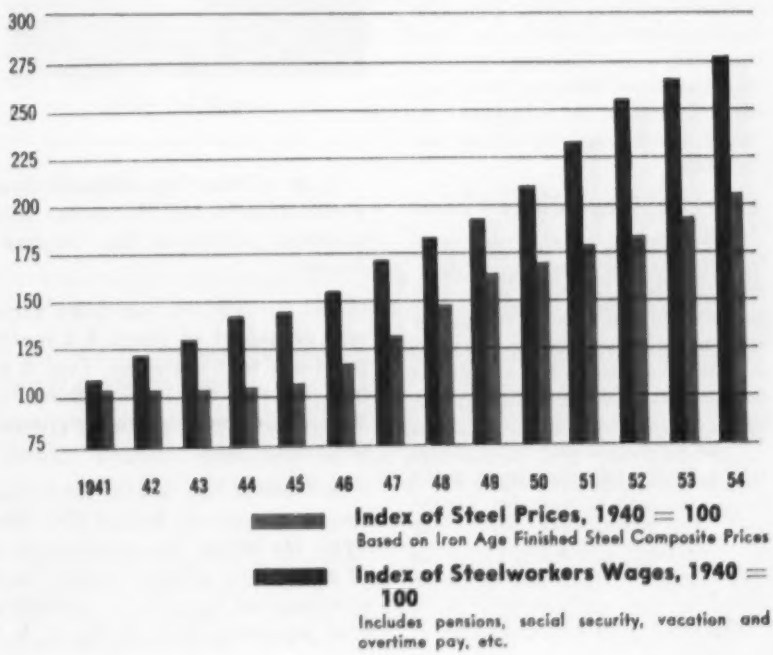
The steel industry must keep an eye on competitive materials such as aluminum and plastics. Other metals and materials have been making steady inroads into steel's markets, and price is a prime factor in the battle for customers.

Usually all these factors are weighed and checked out before a wage settlement is agreed upon. Last-minute adjustments normally delay effective date of the price increases for several days.

The price boosts will vary. Some products will rise more than others. Chances are steel firms will take the opportunity to eliminate any remaining inequities in price structure.

If they listen to certain consumers some companies might boost prices of specific products more than the amount the wage increase seems to justify. Plates are an ex-

How Steel Wages, Prices Compare



ample. This product is now one of the tightest on the list. It will remain tight for months to come.

Some plate consumers have indicated they would prefer to pay a higher price for plates if this would encourage the industry to install more capacity. On the industry's side of this problem is the up and down nature of plate demand. In normal times, there is more than enough plate rolling capacity to meet requirements.

Expansion Problem

Even today, a part of the plate problem, according to producers, is not lack of rolling capacity but rather inability to get enough semi-finished steel due to strong competition within their own plants from other steel products. With railroads back in the picture (see p. 22), rolling capacity may now be a problem but as recently as several weeks ago, producers said they had idle plate rolling space.

This lack of ingot capacity is forcing the industry into another round of expansion which is now getting underway. By 1959, approximately 13.7 million more ingot tons will have been added to the existing 125.8 million. (THE IRON AGE, June 23, '55, p 53.)

With increased ingot production facilities will come the necessity of installing more finishing capacity. As equipment becomes more and more automatic, its cost rises. Inflation also has boosted cost of new facilities.

Needs Risk Capital

The industry faces a real problem. It has to expand and modernize. It has to contend with stiff competition among steel companies and competitive materials. Its price structure must strike a delicate balance between these twin problems.

Steel producers also must maintain a good profit picture in order to attract risk capital for expansion. The prices they receive for their products are a big factor in the showing they make on their profit and loss statements.

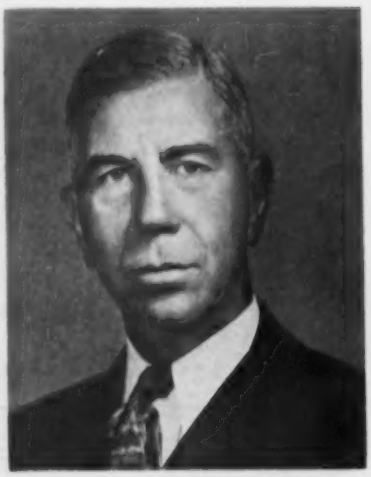
The steel price structure underwent a thorough going over several years ago. At that time, after long study, leading producers put into effect a schedule of base prices and extras that reflected the true cost of production.

These price revisions were long overdue. They would have been put into effect earlier except for price controls following the war. Government officials, with no real conception of the industry's problems, directed price increases that were across the board rather than selective. This tended to aggravate inequities that already existed.

As a result, once price controls were eliminated, steel producers set their price house in order by revising base prices and extras in accordance with their cost-of-production studies. As they learn more about their costs, the steel companies constantly strive to make their prices more and more equitable.

The changes met with approval of consumers, since they put prices on a "you-pay-for-what-you-get" basis.

Leadership Changes Hands at Republic



Charles M. White

T. M. Girdler

T. M. Girdler has stepped down as chief executive officer of Republic Steel Corp. His duties will be assumed by Charles M. White, company president. Mr. Girdler will continue as chairman of the board.

Mr. Girdler, 78, has been chairman since 1929. Prior to that, he was president of Jones & Laughlin Steel Corp., and held important positions with Colorado Fuel & Iron Co., Atlantic Steel Co., Oliver Iron & Steel Co., and Buffalo Forge Co. His service during World War II earned him the distinguished service award of the Army Ordnance Assn.

Mr. White, 64, whose first steel job was as a machinist's helper for the American Bridge Co., has been president of Republic since 1945. He joined the company as assistant vice president in charge of operations after a career with Jones & Laughlin that began as a millwright helper in a sintering plant. When he left he was general superintendent of the J. & L. Aliquippa Works.

LABOR: What's Going On Inside USW?

McDonald has his own problems within the union . . . Rivalry with Autoworkers and union politics prohibits easy settlement . . . "Gold Dust Twins" of steel labor are tough bargainers . . . Pay only issue.

◆ DESPITE protests to the contrary, union politics have always played a part in the outcome of steel labor negotiations. This year is no exception.

Trouble is that steel companies do not necessarily have to go along with the ideas of some union leaders on the contract concessions required to mend union political fences. That's why steel labor negotiations usually are down-to-the-wire battles that leave both sides winded and the final compromise hard to come by.

David J. McDonald, president of the United Steelworkers of America, is as ambitious politically as any union leader in the country. He also has a lot to contend with —rival ambitions within his own union and Walter Reuther, president of the CIO, on a national basis.

Wages Only Issue

When Mr. Reuther came out of his negotiations with the auto companies even better than he himself expected, it put the steelworkers' leader on the defensive. To put himself back into the spotlight, he upped his original estimate of what he would take from the steel companies in the way of a settlement.

He had only wages to talk about this year and he wanted to make the most of it. He also knows that even if current industry prosperity continues he will have to give some on wages in 1956 in order to better his position on social insurance and to get a start on his version of the guaranteed wage.

Behind the scenes is Arthur Goldberg, general union counsel, and for years a "brain" behind the strategy of the steelworkers. Goldberg and McDonald have been the "Gold Dust Twins" in contract negotiations since the death of Philip Murray, the union's founder.

Friction within the steel union has been evident for some time. Its been no secret that Mr. McDonald and Joseph Moloney, district director in the Buffalo region, have been at odds.

The feud blew wide open in recent months when the union president appointed Howard Hague of the Pittsburgh international office as interim vice-president to succeed the late James Thimmes. This did not set well with Mr. Moloney and other old-timers who fought the steel companies in the early organizing phase of the union. Prior to his appointment, Mr. Hague was a comparative unknown. The showdown will come when Mr. Hague and the opposition candidate come up for election.

Mr. McDonald has these things as well as the economic needs of his members on his mind when he goes into negotiations with the steel companies.

On the other hand, the steel union leader is the perfect counterfoil to Mr. Reuther. He was one of the leaders behind the merger of the CIO and A. F. of L., and succeeded in rounding up enough support for it despite the lukewarm attitude of the auto union leader.

Also, when the merger is accomplished, Mr. McDonald will be in there pitching for the interests of the steel companies in the merged organization. Despite their differences on the extent of contract concessions, the steel companies and Mr. McDonald have managed to get along well.

On their side, the steel companies want to get along with Mr. McDonald and have leaned over backwards to do so. They would rather deal with someone they know than have an unknown personality move into the picture.

But the steel negotiators still have the responsibility of safeguarding the interests of the companies they represent.

Union Politics in Steel Negotiations

▪ The political standing of union leaders has always been a factor in steel labor negotiations. Here are a few of the side issues David J. McDonald, president of the steel union, has to think about:

▪ Rival political ambitions within his own union. This situation should reach a climax soon.

▪ His position in the national labor picture. Mr. McDonald and Walter Reuther, president of the auto union and the CIO, have always tried to outdo one another in gaining benefits for their members.

▪ This puts the steel companies in the middle. Union politics have no part in their thinking on what contract concessions should be. Thus the year-to-year battles that usually wind up as a tough compromise between the two views.

FREIGHT CARS: Rush Orders Jam Tracks

Roads late entry into market clogs facilities, creates new steel problems . . . Car builders unable to get steel . . . 50,000 cars will be ordered this month . . . Backlogs of orders are assured for 1956.

• IT'S HAPPENED again. To nobody's surprise and everybody's chagrin, the railroads have launched a whopping freight car building program as the steel boom approaches a frantic pitch. From a steel procurement standpoint, it spells trouble for steel producers, other consumers—and the railroads themselves.

It's an old and frustrating story for steel companies. They have been warning the railroads for months to get their orders on the books. But the rails sat on their hands. Now the mills face the problem of sandwiching heavy railroad business into tight order books.

It was a foregone conclusion that sooner or later railroads would have to enter into a big freight car buying program. (IRON AGE, March 24, 1955, p. 56). But the suddenness and size of orders placed within the past two weeks overwhelmed car makers and the steel industry.

The freight car building program includes 45,000 new freight cars — counting the 7000 which have been ordered since June 1 and the 38,000 which are now being ordered. There are indications that the program may soon reach 50,000 cars.

The 45,000 car program will take approximately 1.2 million tons of finished steel products and castings. A breakdown of the various products follows: 225,000 tons of castings; 180,000 tons of wheels and axles; 270,000 tons of structural shapes; 45,000 tons of steel bars; 315,000 tons of steel plates; and 135,000 tons of sheets.

Later additions to the freight car program will swell this tonnage. Added to this will be several hundred thousand tons of steel needed to repair an additional 25,000 freight cars.

More than 20 pct of the freight car fleet are over 30 years old; over 35 pct more than 25. The average age is about 19 years.

Figures for new orders did not show up in official statistics. Many large programs were placed in confidence. Car makers do not release orders, even to official statistics associations, until the purchasing railroad announces the order.

Scrapped 40,000

A large deficit in total number of freight cars was sustained in 1954, when the railroads, like most industry, had a bad year and hesitated to buy new stock or even replace scrapped cars.

At the outset of 1954, first class railroads had a total of 1,776,017 cars, not including cabooses. During the year, 28,406 new cars were installed, while 68,869 were retired permanently. At the start of 1955, railroads had 1,735,553 cars after sustaining a loss of 40,464.

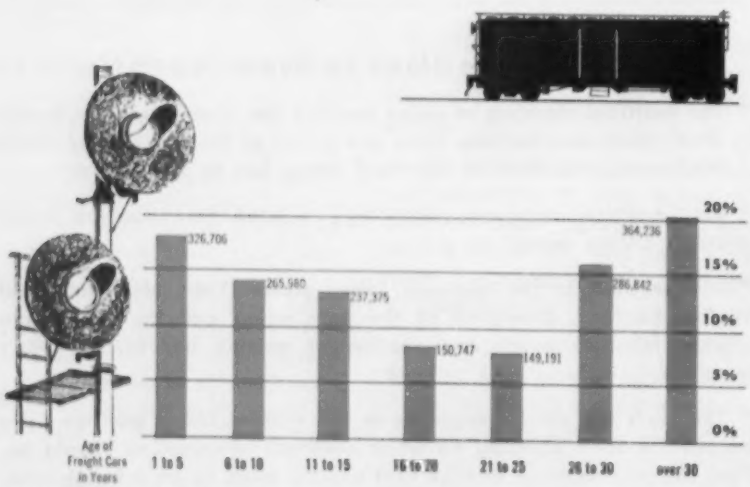
This left the railroads far below the Government's original goal of 1,800,000 cars. Now, after a good look at the expanding economy, that figure seems low and a goal of 1,850,000 is not out of line.

Car makers, steel and railroad officials closest to the picture believe that orders for 50,000 cars will be placed before the end of June, assuring carryovers well into 1956.

It is expected that fast tax write offs of new equipment buying will be granted for five-year amortization on the basis that more cars are needed to handle possible defense needs.

Most recent official figures do not begin to reflect the real picture confronting the railroads, car

How Old Are Our Freight Cars?*



*Average age is 18.99 years.

makers and their supplying industries.

May orders for freight cars showed only a modest upturn, although for the second straight month orders increased. There was a mild buying surge at the first of the year, a slight slump later.

In May, 3041 orders were placed, compared with 2706 in April and only 1071 in May of 1954. Even with this slight upturn, backlogs dropped from 17,930 to 16,886 at the first of June. In 1951, the last real carmaking boom, backlogs of over 150,000 were not unusual.

Traditionally, railroads place orders for new freight cars when carloadings are up, profits coming in. Both of these figures indicated that car ordering programs were ready to roll.

Roads Were Warned

Carloadings through June 18 of this year were following closely to figures of the 1953 boom year. For 1955 they totaled 16,502,507 compared with 17,545,325 for 1953 and were well ahead of the 15,170,107 for the same period of 1954.

For the first three months of 1955, net operating income of Class I railroads was $232,177,806 compared with $145,201,184 in 1954.

Furthermore, shortages of cars were frequent and railroad users have complained of delays in shipments because of non-availability of rail cars.

It is no secret that the steel industry, faced with the clamor of customers for space in the later months of the year, warned the roads, even begged them, to place their orders to avoid confusion later in the year. It may now be too late.

Even though the buying program is only weeks under way, car builders are having trouble placing steel orders.

"I would start two assembly lines today if we had the steel," declared an official of a big car builder.

Much Secrecy

The railroads have followed a policy of secrecy in their first orders, apparently with a cautious eye on the steel market. Caught between the hesitation of the railroads to disclose their plans and the super tight steel market, car makers are in a most uncomfortable position.

The unstable history of the car business has forced many of them to diversify. Capacity has been estimated at 100,000 cars a year, but diversification or dismantling of facilities has depleted the industry's capacity to a much lower figure. Some authorities estimate it at less than 75,000 cars.

Furthermore, railroads have taken over much of the car building for their own shops. However, under the repair and rebuilding programs for old cars, railroad shops have their hands full and the bulk of the new program will fall to independent car makers.

Most Lines Buy

Even in the modest May figures, 2168 car orders were placed with car builders, only 873 with railroad shops, a better ratio for car builders than they had enjoyed recently.

Orders placed with major builders were representative of the entire country, although the earlier upsurge of orders at the first of the year could be traced with western roads. One of the biggest eastern railroads, however, was not among those joining the early June buying spree. But it's getting set to jump in with both feet. Orders for new type cars for special products and technological improvements added to the spurt.

"Forget her!—Understand she has a cold nose!"

IRON & STEEL: MAY OUTPUT BY DISTRICTS

As Reported to the American Iron and Steel Institute

BLAST FURNACE— NET TONS DISTRICTS	Annual Capacity	PIG IRON May	PIG IRON Year to Date	FERROMANG. & SPIEGEL May	FERROMANG. & SPIEGEL Year to Date	TOTAL May	TOTAL Year to Date	TOTAL Pct of Capacity May	TOTAL Pct of Capacity Year to Date
Eastern	17,456,100	1,389,018	6,239,279	25,561	129,177	1,414,569	6,368,456	95.4	88.1
Pitts.-Yngstn.	29,931,670	2,319,402	10,687,749	20,710	109,883	2,340,112	10,797,632	92.0	87.2
Cleve.-Detroit	9,692,000	802,014	3,684,233			802,014	3,684,233	97.4	91.3
Chicago	16,431,050	1,383,151	6,382,626			1,383,151	6,382,626	99.1	93.9
Southern	6,415,080	545,648	2,261,450	5,438	27,831	551,086	2,289,321	101.0	86.2
Western	4,040,800	314,053	1,438,280			314,053	1,438,280	91.5	86.0
TOTAL	83,971,100	6,753,236	30,673,656	51,699	266,891	6,804,935	30,940,547	95.4	89.0

STEEL— NET TONS DISTRICTS	Annual Capacity	TOTAL STEEL May	TOTAL STEEL Year to Date	TOTAL STEEL Pct of Capacity May	TOTAL STEEL Pct of Capacity Year to Date	TOTAL STEEL Index** May	TOTAL STEEL Index** Year to Date	ALLOY STEEL* May	ALLOY STEEL* Year to Date
Eastern	26,487,690	2,163,218	9,950,624	97.0	90.8	157.4	147.5	150,580	622,819
Pitts.-Yngstn.	44,342,030	3,364,770	16,575,139	95.2	90.3	126.4	120.1	903,880	2,408,475
Cleve.-Detroit	13,024,060	1,063,795	4,955,736	98.1	91.9	174.0	166.4	77,920	437,067
Chicago	27,852,700	2,321,889	10,708,697	98.1	92.9	149.2	141.3	132,723	860,140
Southern	7,093,420	574,700	2,537,076	95.4	86.4	164.9	149.5	7,856	30,660
Western	7,026,470	599,951	2,720,563	100.5	93.5	159.5	148.4	17,612	67,110
TOTAL	125,826,310	10,328,318	47,450,835	98.6	91.1	145.2	137.0	890,579	4,246,291

* For the purpose of this report, alloy steel includes stainless and any other steel containing one or more of the following elements in the designated amounts: Manganese in excess of 1.65%, and Silicon in excess of 0.60%, and Copper in excess of 0.60%. It also includes steel containing the following elements in any amount specified or known to have been added to obtain a desired alloying effect: Aluminum, Boron, Chromium, Cobalt, Columbium, Molybdenum, Nickel, Titanium, Tungsten, Vanadium, Zirconium, and other alloying elements.

** Based on average production of the three years 1947 through 1949 as 100.

PRODUCTION

ELECTRICAL STEEL: A Mechanized Market

More electrical power applications increase demand . . . Steel companies push expansion . . . Expanding utilities, home appliances and industry mechanization increase use—*By W. G. Brookfield.*

◆ ELECTRICAL STEEL producers are faced with the bright prospect of a continually growing market for years to come. The growing demand for these specialty grades of steel may avoid the peaks and valleys in overall steel production.

Electrical steel shipments in 1955 threaten to equal or surpass the '53 record of 820,096 tons.

Relatively small quantities required rule out the likelihood that these materials will ever become major tonnage items, but their growing uses make them increasingly important.

Consider a product whose applications range from the use of a fraction of an ounce, such as in a radio audio transformer, to as much as 200,000 pounds in a power transformer and you get an idea of its scope of influence in the American manufacturing economy.

The history of electrical steels dates back to the turn of the century and its growth from that period closely follows the curve of growth of the electrical power industry. Today, electrical power consumption is increasing at the rate of approximately 7.3 pct per year or doubling every ten years. This compares to the national product growth of about 3.5 pct per year.

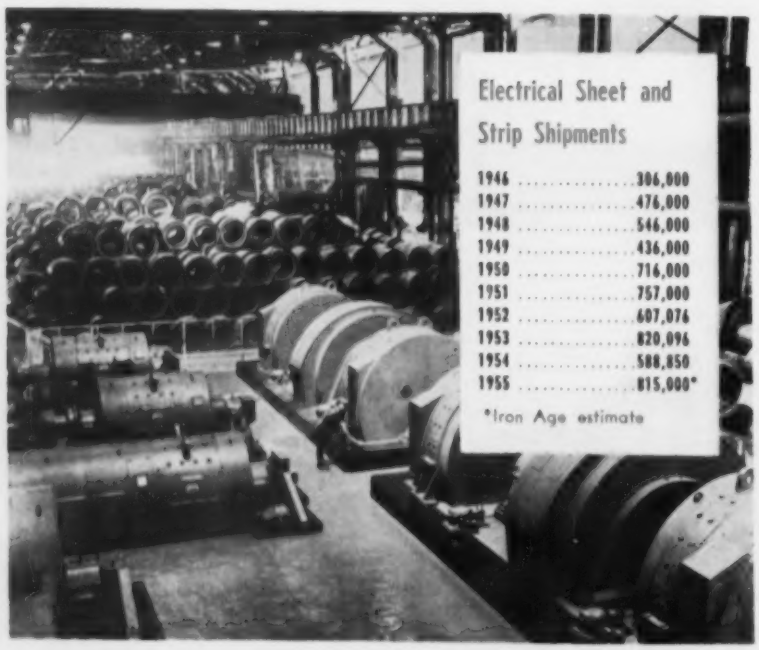
Electrification of homes and farms, closely paralleled by a similar contribution from industry, has been the primary force in expanding the market. With this electrification program a whole new range of electrical products requiring the use of electrical steels came into being.

The uses of electrical steel can be divided into three basic groups:

1. For use in equipment that turns electrical energy into mechanical energy. This encompasses a broad field from the millions of fractional horsepower motors used in appliances, farm machinery, and do-it-yourself tools to the huge motors which power the wheels of industry.

2. For use in equipment that turns mechanical energy into electrical energy. These are primarily generators. These range in size from the type on your automobile to large power generators which supply the country's electrical energy.

3. For use in equipment that changes one type of electrical energy into another. Such as the small transformers for door bell or television set to the large distribution transformers making substantial voltage reductions.



Electrical Sheet and Strip Shipments

1946	306,000
1947	476,000
1948	546,000
1949	436,000
1950	716,000
1951	757,000
1952	607,076
1953	820,096
1954	588,850
1955	815,000*

*Iron Age estimate

Utilities Expand

The increased use of all three groups is followed through the growth in the fractional horsepower motor market as tied in with appliances, home workshop tools, etc. Added to this are the country's huge expansion and automation programs such as in basic steel and aluminum, and equipment necessary to institute this expansion. Finally, in order to meet the electrical power requirements of this vast amount of new equipment, a rapidly expanding electrical utility industry must use an ever increasing number of larger and more efficient generators, transformers and related equipment.

The producers of electrical steel are doing their part to keep up in this battle of production. Most electrical steel in the U. S. is produced by a handful of companies. However, whereas a few years ago there was little competition in the

field, today the smaller producers are increasing facilities and new companies are entering the picture.

The major producers of electrical steel are in a continuing expansion program. Some examples of this expansion are at the Armco Steel Corp. where a $25 million program was announced this spring by the Butler Works. While this expansion program included all grades, it was pointed out that special emphasis would be placed on oriented electrical steel and cold-reduced intermediate electrical steel.

Allegheny-Ludlum has just completed a substantial expansion of its electrical steel facilities and is continuing to expand, particularly with emphasis on the grain oriented electrical steels.

U. S. S. Corp.'s Vandergrift Works, where electrical steel is produced, is also undergoing a complete revamping to increase production facilities and make its position in the grain oriented classes stronger.

More Grain-Oriented

A newcomer in the electrical steel market is the Crucible Steel Co. of America which has entered into an arrangement with the Allis-Chalmers Mfg. Co. to build additional facilities to manufacture grain-oriented transformer quality steel. While Crucible will stick to the grain-oriented steels at first, it will go into manufacture of other grades as soon as feasible. Full production from these new facilities will probably not be reached before the last quarter of 1955.

Get More Power

A look at the expansion reveals a definite trend to a larger share of grain-oriented electrical steel in the overall production picture. The grain-oriented steels, while more expensive, give electrical equipment manufacturers the opportunity to produce smaller and more powerful products. And, as production techniques permit, an even larger share of the electrical steel market will be filled by grain-oriented steels, in the light of developments already made.

PLANNING

SCRAP: Old Elevated Doomed

New York's 3rd Ave. L will yield tonnages of steel and copper scrap . . . High market assures profit for city . . . No chance of scrap going behind Iron Curtain.

FINAL RUN on Third Ave. means more scrap steel for openhearths.

♦ A FAMOUS Manhattan landmark will disappear before the end of the year when the Third Avenue L is demolished.

Much of the 8450 tons of structural steel and fittings will end up as No. 1 heavy melting or perhaps premium grades of scrap destined for the steel industry's openhearth furnaces.

The Borough of Manhattan has asked for bids on wrecking the 77-year-old structure from Chatham Square to East 129th St., including the Harlem River Bridge. All traffic on the L was halted early in May.

According to engineers' estimates, the structure contains 8450 tons of structural steel and fittings, 28,000 ft of pipe handrail, 62,000 lb of copper rail bonds and cables, 10,000 ft of various sizes of control cables, and 550,000 ft of timber ties, guard rails, footwalks and platforms.

This does not include air compressors, signal equipment, transformers, windows, pot belly stoves, station signs and other incidentals.

The L was erected in 1878 and was electrified in 1902 when old steam engines were replaced.

Two types of bidding contracts will be offered. For some parts of the structure, materials have little worth and the city will pay for the wrecking. But price of scrap metals under today's market conditions make much of the wrecking a profitable job and demolishers will bid for the wrecking.

New Yorkers recall that much of the Sixth Avenue L, wrecked prior to World War II, ended up in munitions used by Axis countries. Now, none will go behind the Iron Curtain.

PLASTICS: Big Market in Trailers

There's a $2 billion annual truck and trailer market for plastics to gear up to . . . New truck body kit, all-plastics trailer are pioneer innovations . . . Metals still dominate field—*By D. G. Picinich.*

◆ PLASTICS are finding their way into the truck and trailer field. It's no serious challenge to metals but plastics are making headway.

So far, it's been estimated that out of every $10,000 plunked down for new truck bodies and trailers, around $1 goes to the plastics pioneers. All told, some $2 billion is reported paid out annually for new truck bodies and trailers—a sizable market for plastics to gear up to.

Market Kit

Plastic trucks and trailers have already piqued the imagination of revenue-hungry fleet owners. Reasons cited are that they add more payload without increasing weight, don't rust, corrode, or rot.

Strick Co., Philadelphia, the nation's third biggest builder of truck trailers, has been coming up with answers for wider use of plastics for the past 10 years.

Right now, they're marketing a plastics truck body kit. Components include sides, roof, rear, interior lining and cross members. To assemble, all that's needed are 100 bolts and screws to fabricate the truck body and mount on the metal chassis and cab.

Save on Paint

While costs run about 25 pct higher than for a comparable metal truck, "kit" trucks are said to weigh about 20 pct less than those made of aluminum. This is because use of plastic structural members eliminates the need for heavier stringers found in conventional trucks.

Also, it's estimated that up to $400 saving in re-paint costs over a 10-year period would more than offset initial investment expenditure.

In the trailer field, company engineering is coming up with some new twists in solving some old problems.

One-a-day production of an all-plastics "reefer" trailer is aimed primarily at perishables haulers. Strick considers this refrigerator trailer something of a structural triumph.

See Wide Use

Framework and covering are made entirely from fiberglass-reinforced plastic with aluminum stiffeners. Plastic sheet insides are said to be easy enough to clean so that food won't leave lasting odors. Also, the assembly is reputed to be almost immune to corrosion.

Looking ahead, the company envisages the "Lamicor" trailer as coming to the fore as an all-purpose hauler, handling such heavy items as steel scrap and auto batteries. Plastic construction makes it about one-fifth lighter than a comparable standard trailer. It also allows for about 160 cu ft more space inside without a change in outside dimensions.

But steel is far and away the No. 1 metal in trailer fabrication. American Iron & Steel Institute cites these figures: (1) a smooth panel steel body and frame may require 5300 lbs of rolled steel products—principally sheet steel, (2) a corrugated panel steel body and frame may require 5450 lbs of rolled steel products, (3) a stainless steel body and frame may require 3200 lbs.

In all, says AISI, some 55,000 steel trailer units were produced last year, valued at $250 million.

TWO-WAY roof atop plastic trailer slides off either end, is operated by a hand crank. Replaces conventional open-top tarpaulin covers.

EXPANSION: We Need More of It

Spending for capital goods jumped after the war and has stayed high . . . But comparison with past shows we're still short of equipment and plants . . . Capital spending in 1965 may top 48 billion.

◆ INDUSTRY is far from overloaded with plants and equipment today. Recent expansions have been impressive but have not brought capital goods up to what is considered a normal level; U. S. business figures to put at least $384 billion into new facilities over the next 10 years.

Plant construction and equipment installation fell way off during the depression and war years. At the end of the war in 1945, capital spending jumped. It has stayed high since then but still hasn't made up for the previous slack period. We still don't have all the buildings and machines we need.

Basis for these conclusions is a study of past trends in capital goods by Machinery & Allied Products Institute. The study indicates how much of a plant and equipment outlay we would have today if expansion had continued the way it did from 1900 to 1928.

Not Enough Plants

By this standard we are woefully short of plants and a little shy of equipment. Separate values of plant and equipment stocks run somewhere under $300 billion today. We should have over $100 billion more in plants; a few billion more in equipment.

We have been building plants at the rate of less than $10 billion a year since the war—well under the rate for the projected 1900-1928 curve. Postwar equipment expenditures have run over $20 billion a year. They are above the normal rate and bring the combined rates to higher than average heights for this 10-year period.

Perhaps the most striking figures are those relating capital goods to gross national output. In terms of output, existing production facilities are down 30 pct from the projected norm. The picture many people have of a vast production machine, ready to glut the market if the boom lets up a little, doesn't jibe with historical evaluation of our present condition.

Big Expansion Coming

It all points to bigger and better expansion programs in the future. Curve plotters are confident there will be steady, sizable growth in the next decade but admit it's difficult to arrive at exact figures. Postwar rates are too erratic; pre-depression figures are too distant. However, both these indicate whopping outlays between now and 1965 — between $384.66 and $443.42 billion.

Historical relations are the only criteria used for these predictions. Recent or future developments could throw calculations out of whack but errors figure to be on the low side. Today's stepped-up development pace should make for earlier equipment obsolescence and a higher replacement rate. Capital spending should increase faster than in the past.

Broader retirement plans, shorter workweeks and a government payroll totaling 15 pct of the U. S. labor force add up to an economy that must rely more and more on machines.

One problem the MAPI study shows up: equipment installations have gone ahead twice as fast as plant construction in the past 10 years. In 1935 plants had almost twice the value of equipment: today, the values are almost the same. This could mean an industrial housing shortage is developing.

Add Plant Facilities

Mathews Conveyer Co., Ellwood Pa., has completed a $1 million facilities development program launched in January, 1954.

Completed this month are a new 3-story engineering and office building plus two additions to the firm's existing production plant.

The new structure has 29,000 sq ft of floor space and includes engineering and research facilities.

How Much Will Industry Spend on New Plants, Equipment?

Year	Billions of Dollars	Year	Billions of Dollars
1955	32.00	1962	36.01—43.52
1956	32.73—33.89	1963	37.12—45.12
1957	33.19—35.54	1964	38.25—46.73
1958	33.52—37.15	1965	39.39—48.38
1959	33.72—38.76	——	——
1960	33.83—40.39	**10 year total**	**384.66—443.42**
1961	34.90—41.94		

Source: Machinery & Allied Products Institute

TECH DATA: Are You Missing a Bet?

Uncle Sam puts up $2 billion a year to help industry solve its problems, save money . . . Latest technical data is readily available at a nominal cost . . . Metalworking well represented—*By N. R. Regeimbal.*

◆ YOUR COMPETITORS may be getting the edge on you because they're making use of highly valuable government research reports and you aren't. Over the last few years, government agencies have spent more than $2 billion making important technical and general business information available to industry.

The government reports tell you how to save money, solve production problems, turn out new products. The work is done by universities, private research groups, government research labs and some by industry.

Some projects have cost hundreds of thousands of dollars, have taken years to complete. Results are available to anyone for the asking plus cost of printing—anywhere from 10¢ to $20.

Atomic Energy Commission, for example, will soon make available some 180,000 copies of reports on almost 1000 nuclear research subjects of value to industry. Most of these have been declassified for the first time.

Pick 400 Best

Congress in 1950 set up the Office of Technical Services in a central office of U. S. Commerce Dept. Among earliest OTS catalog entries were the reports of German research scientists captured after World War II.

Today, reports come in at a fantastic rate on every subject imaginable. Each month OTS selects about 400, has them reprinted, and abstracts the report in a digest. The digest is available at $6 a year.

Reports not picked are filed with the Library of Congress. These may also be reproduced if a firm is willing to pay costs of photo reproduction on a copy-by-copy basis.

OTS also has prepared 310 special catalogs on the most popular subjects—listing all available reports on subjects such as steel processes. Recently, a special "package" deal was arranged where 42 reports of research on titanium were sold for a flat price of $40.

Representatives of about 40 companies each month come in to the OTS "library" to sift through reference cards and dig out material.

John Green, OTS director, says the entire technology division, which handles the research reports, costs the government about $140,000 a year, plus a $25,000 revolving fund to pay for printing.

Foreign businessmen are getting more out of OTS than are Americans. The Foreign Operations Administration spends about $300,000 annually sending reports and digests of U. S. technical books and magazines to 52 countries overseas.

There, they are translated, reprinted, and sent out to industry. The Japanese government recently plunked down $250,000 for one order of technical research reports.

Listing government-owned inventions is another function of Office of Technical Services.

Bonanza for Small Business

Are the research reports available through the Commerce Dept.'s Office of Technical Services of real value to industry? OTS has tried to find out.

About 300 small industrial firms, which had visited an OTS show, were queried about what benefits they received from the government. Not all answered, but 61 said they had used processes or ideas suggested in the reports in their production. And 25 more planned to put new products on the market as a result of reading the reports.

Merger:

Speedy decision sought on proposed steel merger.

Bethlehem Steel Co. and Youngstown Sheet and Tube, seeking ways to get a speedy court test of their proposed merger, are asking the Justice Dept. to agree on one of two quickie methods of litigation.

One method involves a little-known section of the antitrust laws which permits the Justice Dept. to file suit in cases of "general public importance" with a senior circuit court judge. The judges may then set up a special, three-man court to hear the case. If this is done, a decision might be expected in a year or 18 months. Such a case takes precedence over other civil actions pending in the court.

Or, Bethlehem says, the department could file its suit in a court which has jurisdiction over the case but which does not have a heavily-loaded docket, if one can be found.

The two companies told Congress recently that they will attempt the merger if a speedy method of testing it in court can be agreed on ahead of time with the Justice Dept. But the two companies will not go ahead if they have to become involved in 6 or 7 years of litigation—the delay of most such cases in most courts.

Deny Tank Order Cut

Pentagon spokesmen are trying to spike a recent report that the present rate of medium tank production is being studied for possible trimming.

No change is planned in the rate at which Chrysler Corp. is turning out the M48 tank at the Newark, Del., tank plant, says the Ordnance Corps. Chrysler is now the sole producer of tanks of any type.

The firm received its latest medium tank contract from the Army last September. This award called for production of 1800 of the M48 series, most modern of the mediums designed as part of the new family of tanks after World War II.

No pressure is on for completion of this latest order on a hurry-up basis, because of an easing of immediate tensions in the Formosa area and southeast Asia. Estimated rate of output is given as 100-plus per month.

Tanks still to be delivered are not required to equip units of the West German army now being formed, it is understood. These units are to be armed with equipment already designated.

Push New Fighters

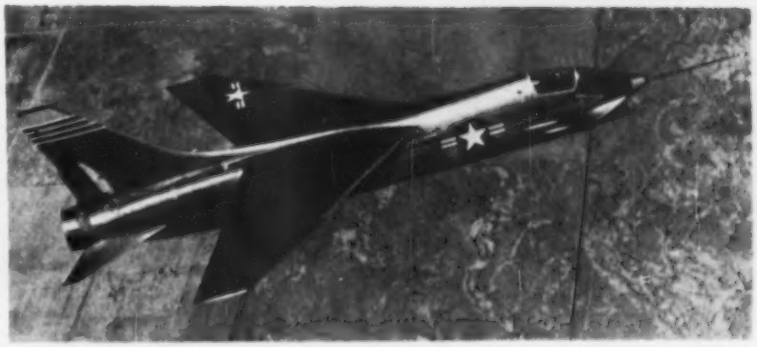
Quantity production of two new supersonic planes, the F-101 and the F-104, is proposed by the Air Force to back up a faster output of strategic bombers.

Development of the new planes, says Air Force Sec. Talbott, has been speedier than was realized when the defense budget for fiscal 1956 was planned last fall.

The F-101, built by McDonnell Aircraft Corp., St. Louis, is a long-range fighter designed for use by the Strategic Air Command. Lockheed Aircraft Corp., Burbank, Calif., produces the F-104, a high-altitude intercepter which may replace the F-100 Super Sabre.

Funds that the Air Force expects to have available may cover costs of the increased output. If not, Mr. Talbott will ask Congress for additional money.

He does not recommend greater production of the F-100 and the F-102, a new intercepter, at this time.



LOOKS GOOD: New jet fighter, XF8U-1, features fuel economy, good vision for Navy carrier work. Plane was built by Chance Vought Aircraft, Dallas.

Jets:

New carrier fighter pleases Navy in tests.

Test flights of a new jet fighter, the XF8U-1, are strengthening the Navy's confidence in its ability to control the air above its carrier forces.

Designed to fly faster than the speed of sound, the fighter probably will have a combat ceiling of more than 50,000 ft. It is a product of Chance Vought Aircraft, Dallas.

Use of titanium in the aft-section and part of the mid-section has cut the plane weight. A simplified pilot ejection seat, weighing 30 lb. has brought an added weight saving.

Conformation of the new plane features thin, swept wings, mounted high on the fuselage well back of the cockpit. A short pointed nose helps reduce drag, gives the pilot greater visibility to the front.

The power plant is the Pratt & Whitney J-57-P-4 turbojet with afterburner. Navy expects this engine to permit fuel economy that will lead to long endurance aloft. Range and visibility features of the plane are cited in favor of its successful operation with carriers.

The XF8U-1 has been undergoing tests at Edwards Air Force Base, Calif. The Navy describes the tests as successful, says the plane is designed to give better air control in sea operations. As yet, however, no Navy orders have been placed for the plane.

"Well, well, look at this. Monkey wrench on rye."

Change Skysweepers

Radar - operated "Skysweeper" antiaircraft guns, part of the continental defense system, are to be improved by the use of modification kits produced by the AC Spark Plug Div., General Motors Corp.

The division has a new Army contract, amounting to $2.8 million, to make changes in fire control units now on order and to turn out kits for guns already assembled at the Watertown, Mass., arsenal.

Army says changes will increase effectiveness of 75 mm guns.

EXPANSION IN INDUSTRY

Appliances:

New Hotpoint facilities will produce 1.2 million units.

New home washer-dryer plant of Hotpoint Co., Chicago, will have an annual production capacity of 400,000 units—or when demand is brisk—one appliance every 40 sec.

Total output capacity of the Midwest appliance producer's new Chicago plant will come to 1.2 million major units yearly—including stoves, refrigerators, driers and washers.

It's estimated that the washer-dryer plant will consume 40,000 tons of finished steel a year—principally cold-rolled and galvanized sheet in four press lines. Enameling facilities include a $350,000 porcelain enameling furnace rated at 2275 kw an hour.

A 7.8 mile overhead conveyor system, costing more than $1 million, will carry plant production through every phase of manufacturing operations. It will also serve as an in-plant overhead storage area for components prior to assembly.

The new 500,000 sq ft installation was built over existing facilities at the GE division.

Erect 'Automatic' Plant

Westinghouse Electric Corp., Pittsburgh, has completed plans for construction of its most highly automatic plant.

Completion of the multi-million dollar installation at Youngwood, Pa., is slated for late this year.

The new facility will turn out semi-conductor devices such as transistors, power rectifiers, high frequency detectors and photo-cells. The plant will be located on a 119-acre site close by the Pennsylvania Turnpike and will be operated by the company's newly-formed semi-conductor department.

Plant production will be geared to meeting increased demand for greater automation in industry as well as stepped up needs by TV and radio manufacturers.

Many of the semi-conductors used in the construction of the company's recently announced Cypak control system will be produced at the new facility.

Ask Tax Write-off

United States Steel Corp. has requested from the Office of Defense Mobilization certificates of necessity which would permit rapid tax write-offs in the total amount of $200 million. Half of this expansion would be in Pittsburgh area and would include $75 million for improvements at U. S. Steel's Duquesne works and $25 million for a new "mystery" project at Houseville, Butler County. The company declines to comment on its plans for a new installation on the Bessemer and Lake Erie RR at Houseville.

Other projects in the program include improvements to rolling mills at the South Chicago Works and to flat-rolled facilities at the Fairless Works.

Improvements for the Duquesne Works will be on blast furnaces, electric furnaces and rolling mills.

Will Step Up Output

The Reid-Avery Co., Baltimore, is installing three new coiling machines, a continuous electrolytic copper plating machine, a continuous annealing line in addition to updating parts of the firm's wire drawing facilities.

New installations are aimed at increasing production of all types of alloy and specialty wires in addition to low alloy and mild steel grades of rewound coils.

Boost Plant Sites

First unit of a long-range plant development program by De Laval Steam Turbine Co. is in operation adjacent to existing manufacturing facilities at Trenton, N. J.

The new installation turns out high pressure turbochargers for diesel and gas engines.

Recently announced plans also call for construction of new facilities at Houston, Tex., and Forrest Park, Ill. A new 40,000 sq ft installation, scheduled for completion in August at Millbrae, Calif., will house sales and service facilities of the company's West Coast subsidiary.

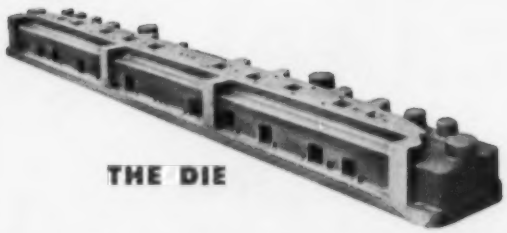
Fabricated Structural Steel

Contracts, Shipments, Backlog for April, 1955

	1955	1954	Estimated Net Tons Avg. 1947-50
CONTRACTS CLOSED			
April	269,703	184,982	177,825
Year to Date	1,030,395	822,845	713,374
SHIPMENTS			
April	239,658	293,532	192,861
Year to Date	906,660	1,077,645	712,238
BACKLOG	1,443,506	1,566,214	1,190,607

Source: American Institute of Steel Construction

AT NEMCO FOUNDRY: ANOTHER PROBLEM SOLVED BY CITIES SERVICE CORE OIL



THE DIE

The die pictured here was cast at Nemco Foundry for use by the Spartan Aircraft Company in producing roof ribs for its Spartan Mobile Home. Difficult to produce, it required 10 cores 2⅝″ x 2⅝″ square and 25 cores, quarter-circle in shape, from ¾″ to 1″ in diameter. Semi-circular shape was necessary to core curved slots from top of die to sides. Holes had to be clean and free from obstruction, allowing stamped slugs to fall through. Nemco relied on Cities Service Delco Core Oil to help meet exact specifications. "A smart choice," says J. A. Dean, General Manager. "Delco Core Oil made the job far easier."

THE ROOF RIBS

The roof ribs of this Spartan trailer, cast from the die produced at Nemco, are visual proof of a job well done. "The great strength and high collapsibility of Cities Service Delco Core Oil share a lot of the credit," says Nemco.

THE FINISHED PRODUCT

The finished product is this handsome Spartan Mobile Home awaiting shipment to consumer. Spartan's rigid specifications help make it one of the safest and best on the market.

Difficult casting of die to form roof ribs for Spartan Mobile Home made easier by Cities Service Delco #36

Located in Tulsa, Oklahoma, Nemco Foundry enjoys attacking the really tough jobs and making them easier. And often helping to spearhead the attack is Cities Service, as described here by J. A. Dean, General Manager:

"Recently Cities Service Delco #36 Core Oil again solved a tough job for us in fulfilling the requirements for a casting for the Spartan Aircraft Company, makers of Spartan Mobile Homes. The casting was a bottom shoe for blanking die to make roof ribs for the all-aluminum shells for Spartan trailers.

"The die was of Nemcoloy, Type AL, an alloyed grey iron. It was 106″ long, 8″ thick and 13½″ wide, and weighed 2,018 lbs. cleaned.

"It required 10 cores 2⅝″ x 2⅝″ square. In addition, it demanded 25 cores, quarter-circle in shape, ranging from ¾″ to 1″ in diameter. Semi-circular design was necessary in order to core curved slots from the top of the die to the sides of the die. Holes had to be clean and free of obstructions allowing the stamped slugs to fall through the die to the outside and not hang up.

"Cities Service Delco #36 Core Oil enabled us to meet these requirements perfectly. We certainly recommend it where great strength and high collapsibility are needed."

Like Nemco, scores of other foundries have reported unusual results with problem-solving Cities Service Core Oils. Nor does the praise end with the product . . . for time and again the solution for the proper core oil has resulted from the knowledge, understanding and experience of a Cities Service Lubrication Engineer. If you have a lubrication problem, why not talk it over with one of these Cities Service experts? Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

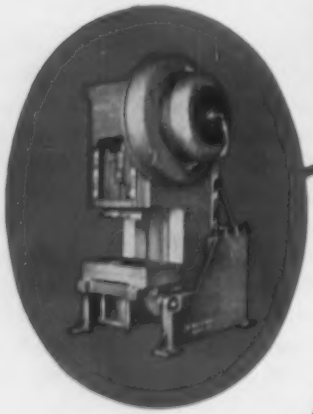
CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

A Minster Press means

LESS SCRAP

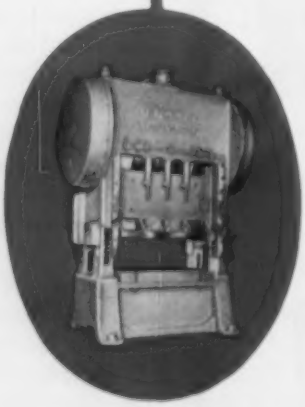
BUY MINSTER AND BE SURE YOU GET THE RIGHT PRESS FOR THE JOB



Minster
Series 1 O.B.I. Presses

What did your scrapped stampings cost you this week in material, labor, machine time, production loss and rehandling?

Minster
Series S-1 Presses



Minster
Series S-2 Presses

Minster Presses cut scrap loss, save you money because they provide:

1. Greater frame rigidity, with less deflection.
2. Extra long ways and gibs, widely spaced and precision finished, assure slide and bed parallelism.
3. Fast action, controlled cycling with Minster's patented Air Operated Combination Friction Clutch and Brake.
4. Minster Controls combine with fast clutch action to help reduce scrap caused by misfeeding.

Build a sound replacement program modernize with Minster Presses

THE MINSTER MACHINE COMPANY

MINSTER, OHIO

MINSTER®

PRESSES

Stainless Steel bulb for color television tube by I-T-E Circuit Breaker Co., Philadelphia, Pa.

Spinning Stainless Steel circles into cone.

Forming cone on 500-ton hydraulic press.

How Stainless Steel helps I-T-E put color into television

Television is opening up a whole, wide wonderful world of color and Stainless Steel is playing an important part in this great advancement. I-T-E Circuit Breaker Company is manufacturing the bulb assembly for color television using cones made from Stainless Steel.

The advantages lie in the light weight made possible by metal shell construction—a highly important consideration at this stage of color tube development—the safety factor of a metal-glass tube and the ability to use a higher-quality glass in the picture surface. Stainless Steel's coefficient of thermal expansion makes it a suitable material for a metal-glass bond.

I-T-E's choice of Stainless Type 430 for its color TV development was a natural as they have produced millions of Stainless Type 430 cones for black and white picture tubes ranging from 8½" diameter sizes to 27" rectangulars.

Stainless Steel's unique combination of properties merits consideration in all types of design problems. And it's not a difficult material to fabricate. Investigate Stainless Steel for your products, and when you do, be sure to use service-tested USS Stainless Steel.

SEE The United States Steel Hour.
It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

FABRICATING FACTS

For the bulb circles of USS Stainless Steel .125" thick are used. Circles are shear formed on a spinning lathe to produce a cone 21" in diameter, tapering to 8" by 14" deep.

Cone is further formed on 500-ton press. Panel is sheared from funnel, flanges are formed and deburred and both parts sandblasted to receive glass.

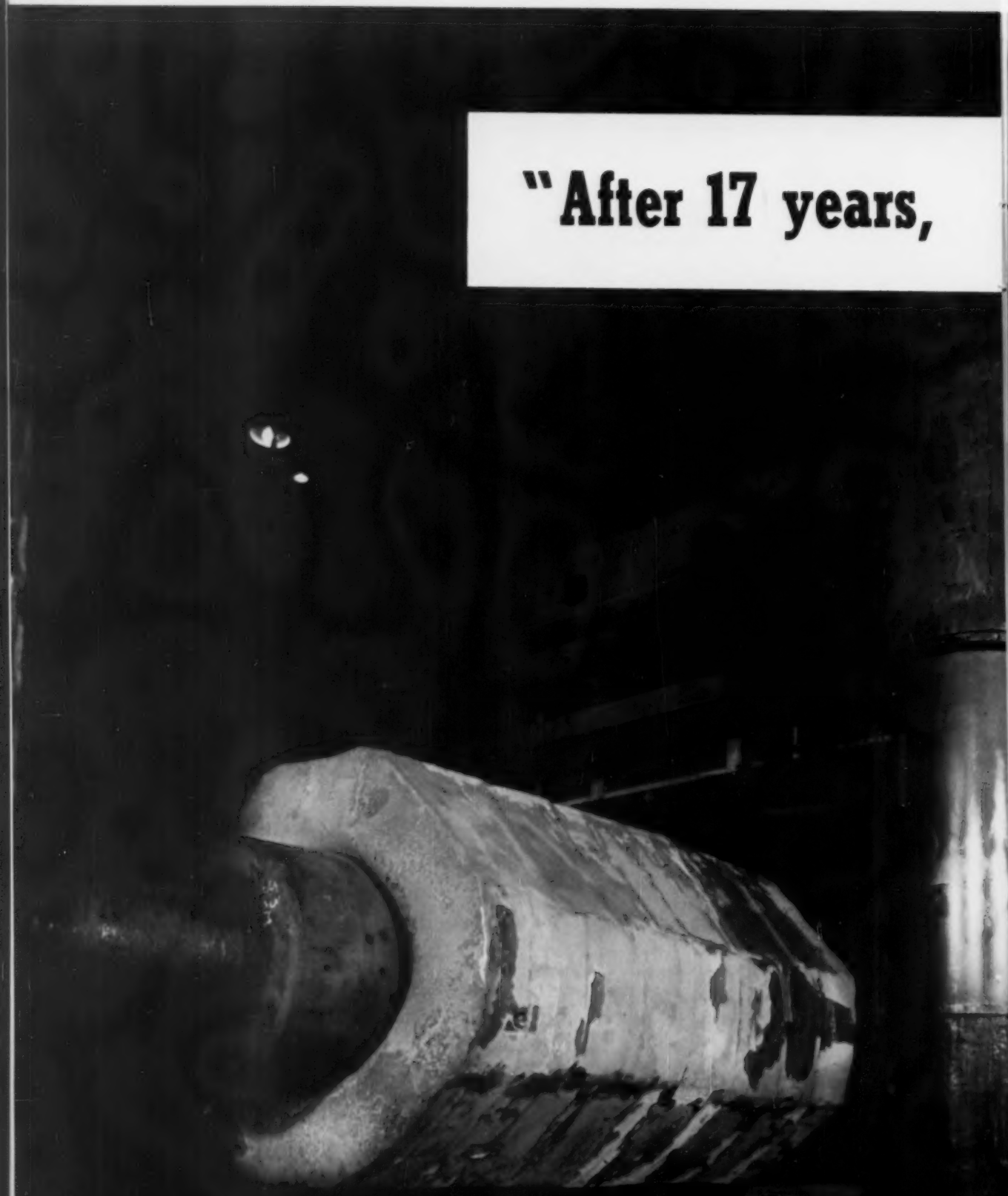
UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

"After 17 years,



UNITED STATES STEEL

tough jobs like this become easy"

—says Jimmy Fenchak, U·S·STEEL PRESSMAN

● Jimmy has worked in our Homestead Forgings Division for 17 years—as crane floorman, press helper, craneman, press driver and manipulator operator.

Under his skillful care, the raw ingot gets its first and perhaps most important handling. Jimmy has to coordinate two cranes, a manipulator and the press itself to squeeze the rough ingot into a dense, tough piece of steel—accurately shaped to close dimensions.

That piece in the photo is a good example. It's going to be the main cylinder in an unusually large press of radical design. The press itself will be used for the relatively new method of cold-forming sheet metal over rubber dies.

But the most unusual feature of this forging is the fact that, after it is forged to size, we *squash* it into an oval shape. This shape is required because of unusual stress concentrations in the walls of the press cylinder. The cylinder forging, when completed, will be 14 feet long, 7 feet in diameter, 13 inches thick. It weighs 250,000 lbs.

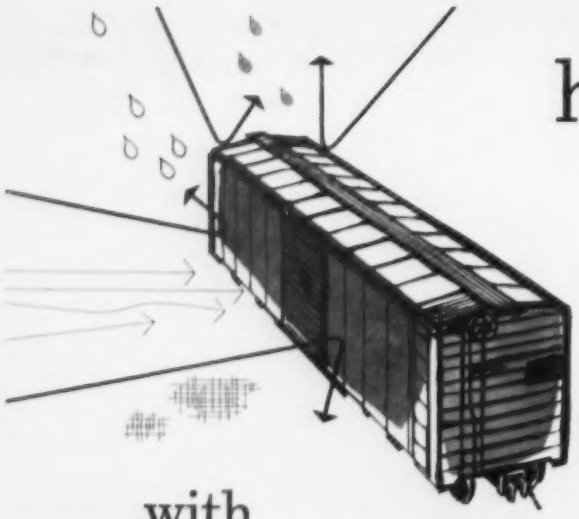
The Pressman is all-important in a tricky job like this. The hole must be absolutely centered. The entire forging must be sound and free from flaws. And when the time comes to actually apply the big squeeze to form the oval, everything must be synchronized: ingot temperature, ingot position and the amount of pressure exerted by the press.

Fortunately, tough jobs like this are old stuff to U. S. Steel Pressmen like Jimmy Fenchak. Everybody in the crew knows that the job will come off without a hitch.

Our point is this: when you want a truly *quality* forging, you'll be wise to put the job in the hands of men like Jimmy. His skill, combined with the finest steel and machinery, is your best assurance of quality when you buy from United States Steel. For more information on U·S·S Quality Forgings, write to United States Steel, 525 William Penn Place, Room 4782, Pittsburgh 30, Pa.

USS Quality FORGINGS

- heavy machinery parts—carbon, alloy, stainless
- electrical and water wheel shafts
- hammer bases and columns
- marine forgings



how to rust-proof a freight-car with FERRO-PAK®

by Cromwell

A leading wire manufacturer discovered this economical, easy way to use Cromwell Ferro-Pak VCI Paper to insure rust-free shipping of bright finished wire. Wire coils are shrouded with sheets of Ferro-Pak and the paper is used to line the sides of the car as well. Chemical vapors travel outward from both sides of the paper, forming an invisible protective film around the wire that doesn't give rust a chance to get a foothold. Non-toxic Ferro-Pak vapors are effective almost indefinitely under most conditions.

Think how this clean, fast, easy rust preventive method can save you money! No more dipping, slushing, scraping, wiping. No more costly extra packaging. To protect any ferrous metal product, you simply wrap it and it's rust-proofed—unwrap it and it's ready to use. Ferro-Pak comes in rolls, sheets, bags, envelopes, liners and covers. And we combine it with many other materials for a wide range of special uses.

For an interesting brochure on how you can cut costs with Ferro-Pak in packaging, shipping, storage and maintenance, write on your letterhead today.

Cromwell PAPER COMPANY • 4803 South Whipple Street • Chicago 32, Illinois •

MANUFACTURERS OF: Papers (Impregnated • Coated • Laminated • Reinforced • Flexible) Bags • Sacks • Liners • Covers • (Single and multiwall construction, using all types of material to carry, cover or protect all types of products.)

Shrouding with Ferro-Pak VCI Paper quickly transforms an ordinary freight-car into a huge rust-proof package.

PLANNING

Report To Management

Higher Prices Are Coming

If you have been at all alert to your business costs, you must have observed the start of an upward price spiral weeks ago. Probably copper was the first basic material to climb significantly. Other materials followed.

It was easy to blame the stockpile for these higher prices. But those coming up within days or weeks can't be attributed to artificial factors. And they won't be subject to subsequent downward trends. They will be based on solid, permanent factors that can't be withdrawn.

Steel will be the big influence in revision of price tags all along industry. Steel prices will have to be raised to keep up with inevitable, substantial pay raises.

Part of the increased labor costs will be made up in increased production, but this can't absorb all of the increased cost in an industry already in need of higher earnings for investors.

Pricing Problems Will Cause Headaches

Seldom have business booms been accompanied by competitive markets. Usually they have resulted from a big excess of demand over supply.

Businessmen are afraid of pricing themselves out of the market, particularly for consumers goods. But they can't take much more in the way of higher costs for labor and materials.

Management has shown commendable restraint in the past 5 years and it deserves a lot of credit for doing its part in fighting inflation. Now some dangerous inflationary forces are at work and they will have to be kept from snowballing.

The Administration Will Help

Secretary of the Treasury George M. Humphrey has consistently warned against inflation. You can be sure he will put to bear all pressure possible against runaway prices.

Inflation is a pet subject with him and his thoughts are constantly on the ultimate consumer. He knows there is little to be gained if the man on the street wins nothing from a pay raise because of higher prices for the goods he wants and needs to buy.

Furthermore, people living on pensions and annuities are at the mercy of higher price trends. They can't bargain for increases in a fixed income. The Treasury chief is determined that these won't become the forgotten people.

Then There Is Simple Politics

Remember that the present Administration is tagged the businessman's administration. Powerful restraints will be practiced by far seeing business people to make sure their action's will not react to the detriment of the Administration.

These influences can't stop the entire threat. Inflationary forces are too strong to be kept completely in check. It does mean that a big segment of business and a very strong part of the Administration will do its best to keep them within bounds.

It should not reach the point where buying is affected to the point where it could bring the economic house down.

Grads Have It Good

This year's crop of graduates has better job opportunities than ever. From New England to West Coast, pay is up and recruiting is more active.

Employers who don't look to the campus ahead of time to get a line on good students who can become valuable men in their organization are going to be left at the post.

INDUSTRIAL BRIEFS

Broad Operations . . . A new organization, Gemco, Inc., has been formed by Frederick W. Richmond to provide a wide range of services to industrial and business enterprises. The new company will offer economic, financial, design, construction and other services in the field of metalworking and durable goods. Mr. Richmond is chairman of six machine tool and metalworking companies.

Realignment . . . Allis-Chalmers Manufacturing Co. has realigned its operating divisions to strengthen market position and to provide faster direct line of service to customers. Six divisions have been established, three each in Tractor and Industries groups. In the Tractor group are Construction Machinery Div., Buda Div., and Farm Equipment Div. In Industries group are Power Equipment Div., Industrial Equipment Div. and General Products Div.

Lighting Up . . . Chester Blast Furnace, Inc., Chester, Pa., is expected to be back in operation in approximately 30 days. The blast furnace is a subsidiary of Barium Steel Corp., New York.

More Coils . . . Trane Co., La Crosse, Wis., has opened a new 55,000 sq ft coil manufacturing plant, consolidating all of the company's coil production in one location and increasing capacity more than 25 pct. The company is one of the nation's largest producers of cooling and heating coils.

More Box Cars . . . Erie Railroad has sold $3,270,000 in equipment trust certificates to finance approximately 80 pct of the cost of 500 box cars estimated to cost a total of $4,100,000. Delivery is expected in the third quarter of this year.

Expanding . . . The Union Steel Products Company of Albion, Michigan, has purchased the land and buildings recently vacated by the Colson-Service Div. of the Colson Corp. of Elyria, Ohio. The newly acquired plant is being converted for the increased production of the company's major line of Palletainers, materials handling baskets and other allied products.

Ore Carrier . . . The first of two ore carriers being built in Britain to the order of the Iron Ore Transport Co., Ltd., will be launched at Haverton-Hill, Billingham, in England. Partners in the Iron Ore Transport Co. are Wheeling Steel Corp., Armco Steel Corp., Hanna Coal & Ore Corp., National Steel Corp., and The Youngstown Sheet & Tube Co. The vessel will be in the iron ore trade between Sept Iles, Province of Quebec, Canada and the Atlantic Ports, U. S. A.

New Warehouse . . . A contract has been awarded Robert E. Lamb & Son, Inc., Philadelphia industrial construction firm, for the erection of a huge new warehouse at the Pottstown plant of Firestone Tire and Rubber Co. The new warehouse will make it possible for Firestone to replace all the smaller warehouses scattered throughout Philadelphia and Camden.

Safety Contest . . . The Institute of Scrap Iron & Steel, Washington, announced today the opening of its scrap yard safety contest for 1955. The contest runs for the 5 month period ended next October 30. There are two classifications of yards: those with 10 or fewer employees and those with 11 or more employees. A plaque will be awarded to the winner in each classification. Certificates will be presented to the second and third ranking yard.

Consolidation . . . The Michigan Steel Casting Co. has acquired the Standard Alloy Co. of Cleveland. Its operations, patterns, and certain of the production personnel will be moved into the larger plant at Detroit. The Cleveland plant has been sold. In combining operations, Misco is widening its range of products and technical skills.

Transfer . . . The Bloomington, Minn., plant of the Baker-Lull Div. of the Baker-Raulang Co. near Minneapolis will close on or about September 30th and transfer its remaining manufacturing and service operations to the Baker-Raulang plant at Cleveland.

Cooling System . . . The York Corp. has started construction of a giant cooling system to be installed in the Capitol Power Plant in Washington, D. C., from which it will serve the air conditioning systems in seven large government buildings.

Turbo-Prop . . . The first certificate ever awarded by the Civil Aeronautics Administration for commercial operation of a turboprop engine has been issued to the Allison Div. of General Motors Corp. The plane, called Allison Model 501, will be ready for use in 1957.

New Divisions . . . The Foxboro Co., of Foxboro, Mass., has established ten regional sales divisions, with territories arranged for maximum service to industrial instrument users. The new regional structure will permit full utilization of the company's 48 branch offices.

Distributor . . . Atkins Saw Div., Borg-Warner Corp., Indianapolis, has retained the E. F. McCarthy Co., Inc., as the Atkins industrial distributor in the Buffalo area.

There's built-in durability in

WEIRKOTE

for all sheet-metal work

Wherever a durable zinc-coated material is needed for sheet metal fabrication, there's nothing better than Weirkote. Gutters, downspouts, ducts—no matter what the application, the name Weirkote on galvanized steel means uniformly high quality steel, tightly coated with zinc to resist cracking, peeling, flaking and corrosion. The high quality is assured by Weirton's modern mills and methods —and men.

When your specifications call for galvanized steel, call Weirton, and be sure.

Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.

PITTSBURGH LOCK

WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION

Three Cars a Minute Easy at Plymouth

World's largest assembly plant a miracle of integration . . . Over 70 freight cars and 300 trucks unload parts . . . Miles of conveyors tied in by telautograph deliver to assembly points—By *T. L. Carry.*

◆ OVER 2000 CARS a day are being assembled at Plymouth's main assembly plant in Detroit. Production of one car a minute used to be considered a remarkable feat but, if Plymouth's capacity was used to its full extent, the division could turn out one car every 20 sec.

Plymouth has the largest assembly plant in the world. It is one-half mile long and one-eighth of a mile wide and it is all on one floor. The plant has no storage space as such but receiving necessary material for assembling cars from its suppliers is a continuous process. Over 8 million lb of material, exclusive of bodies and engines, are brought into the plant daily.

Miles of Conveyors . . . The delivery job is handled by over 70 freight cars and 300 trucks which bring in such material as bodies, fenders, wheels, and steering columns. When the material is unloaded, it is put on a conveyor system in such a way that the right color wheels will match the right color car body at the precise moment they are to be attached to the car.

The plant uses 27 miles of conveyor lines and some of them are 1 mile long.

Production at the plant is highly integrated through a telautograph system.

Plymouth doesn't produce a car until it gets a definite order from a dealer. When these orders come in, they are tabulated on several cards and the actual building of the auto is scheduled 10 days ahead of production.

Integrated Operations . . . The tabulating work is done at the plant's new office building. A modern electronic system is used for handling orders for cars. The tabulating department uses 6 million cards a month in recording and distributing information.

On the day a car is built, a message is teletyped to the assembly plant when a finished body leaves the body plant. When the body is unloaded at the assembly plant a telautograph message is sent to the various departments and contains the information necessary for assembling the car. On the frame line, for example, the right frame is chosen and placed at a proper interval on the right line. The same policy is followed for fenders, wheels and motors.

Before the motors are put into the cars, however, each one is run on a test block for 30 min at 1000 rpm. This is the equivalent of 30 mph. The division uses natural gas for these tests instead of ordinary gasoline. Natural gas is safer in a large plant and is cheaper to buy when it is purchased in large lots.

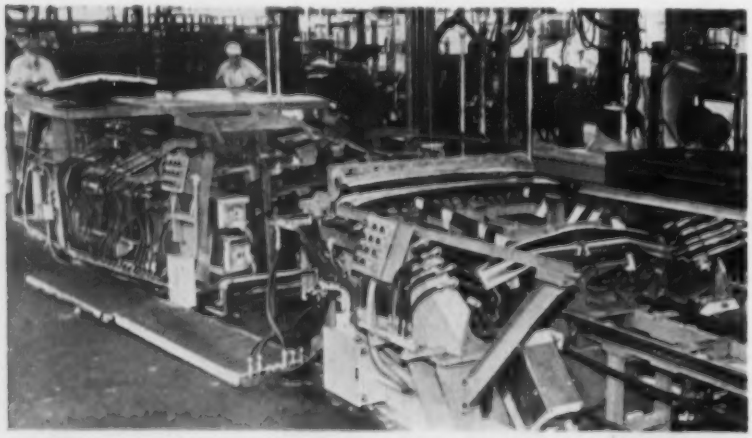
In 27 years, Plymouth has expanded the plant from its original 370,000 sq ft of floor space to 1,300,000 sq ft.

Thousands of Tools . . . In order to obtain the high production, two main assembly lines are used during the day shift and one line is used on the afternoon shift.

Assembling the cars requires the use of 1500 machine tools, 1200 power tools and 5000 electric motors.

In addition to the plant in Detroit, Plymouth has other smaller assembly plants at Los Angeles and Evansville, Ind.

Turn Page



AUTOMATIC welding machines at the Plymouth assembly plant in Detroit, world's largest assembly plant. It can turn out a car in 20 seconds.

Plating development works big changes in metal finishing

♦ Companies plating products with chromium are switching to an advanced process developed by United Chromium . . .

♦ Benefits achieved include fast production, increases in capacity of existing equipment, savings in power, better finishing . . .

Things changed abruptly a few short years ago for companies finishing products with chromium when the Unichrome SRHS Chromium Plating Solution was introduced. It gave users a more efficient, more easily controlled and faster process . . . resulting in better finishing and substantial savings. Here are some recent reports from the field:

EFFICIENCY UP . . . POWER BILLS DOWN

A 60% reduction in power costs was achieved by SRHS when it was installed by one of the country's leading manufacturers of electrical appliances. A 50% slash in power need was made in another plant.

SAME EQUIPMENT . . . 66% MORE CAPACITY

Existing equipment gained 66% additional capacity when SRHS replaced the ordinary solution in the plant of a prominent automotive manufacturer. The change avoided need for costly overtime or extra equipment to increase output.

And on top of such cost reductions, there are also better results with SRHS Solutions. Users get fewer rejects, better color, better coverage of intricate parts, more uniform plates.

This is just one of many United Chromium developments in processes, equipment and materials which provide opportunities to cut your finishing costs . . . opportunities to turn out a better product through a better finish. We'd welcome the chance to work with you.

UNICHROME Trade Mark

METALLIC and ORGANIC FINISHES . . . EQUIPMENT

UNITED CHROMIUM DIVISION
METAL & THERMIT CORPORATION

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Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif.
In Canada: United Chromium Limited, Toronto 1, Ont.

ENGINEERED

FOR FASTER—MORE PROFITABLE PORTABLE GRINDING

The sectional view of the wheel shows the location of the mounting nut assembly and the rigid, steel ring.

The deeply imbedded "fingers" of the metal insert reduce the effect of torque on the threaded area . . . assure greater safety and reliability.

The right or wrong grinding wheel specification can be the difference between making and losing money on your portable jobs. The correct Sterling specification costs no more, but does require deeper, more intensive study on our part. This is what makes the difference . . . creates the "Wheels of Industry" that are the finest you can use.

Eliminate guesswork by specifying Sterling engineered grinding wheels for all operations in your plant. Ask for the services of a Sterling abrasive engineer today. Your letter or phone call will bring him immediately.

THE WHEELS OF INDUSTRY
STERLING ABRASIVES

STERLING GRINDING WHEEL CO., TIFFIN, OHIO

A SUBSIDIARY OF

ABRASIVE AND METAL PRODUCTS CO.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

More Cars:

Confident GM, Ford Rush More New Plants.

General Motors Corp. and the Ford Co. don't have any doubts about the future of the new car market. Ford earlier this year announced a $625 million expansion program and now GM has just revealed that it will spend $500 million to meet the needs of an expanding market.

The GM announcement was made by Harlow H. Curtice, president of the corporation, who said the money will be spent to increase the capacity of GM's automotive divisions and enable the corporation to keep pace with future growth of the market.

$4 Billion for GM

The new expansion program is expected to be completed by the end of 1956 and will bring to $4 billion the amount GM has spent in the U. S. and Canada for capital improvements since the end of World War II.

Mr. Curtice did not say specifically where the money would be spent but the program will include the addition of 6,300,000 sq ft of floor space. The bulk of the money will be used for new machine tools, presses and other facilities.

Ford's latest expansion is already well underway.

Engines for Ford

Among the latest additions to be announced are the company's fourth postwar engine plant which will be built near Lima, O.; expansion of the Buffalo and Walton Hills, O., stamping plants; additions to the two engine plants in Cleveland and purchase of property in Sharonville, O., for the construction of a new automatic transmission plant.

Expansion at the Cleveland plants is necessary, according to Ford, to meet increased requirements for engines. Construction details of the automatic transmission plant in Sharonville, have not yet been released.

Announcements followed closely settlement of 3-year contracts with the UAW.

Mileage:

Engineers Build Economy into New Engine Design.

The most promising field for further reduction of the nation's auto gasoline bill is in new combustion chamber design.

It is one of the hottest problems in the industry—how to increase further compression ratios and engine efficiency with fuels now on the market.

Engineers call this building "mechanical octane numbers" into the engine as contrasted with "chemical octane numbers" that are built into the gasoline.

GM Research Laboratory engineers report that experiments with various combustion chamber shapes had shown wide differences in allowable compression ratio limits and helped establish fundamental design information for improved combustion chambers.

Gasoline Bill High

The tests also showed the advantages of compact chambers in which the air fuel mixture is burned before the chemical reaction that causes engine knocking sets in.

The nation's automobiles burn 44 billion gal of gasoline a year at a cost of over $13 billion.

A 300-mile cross-country driving test, including both city and country driving, has been conducted since 1948 to gage the amount of mileage the average motorist could get. In 1948, the average was 15.7 miles per gal. This year the average has climbed to 18.6, a gain of 20 pct. The progress represents a saving of more than $40 a year to each motorist.

Automotive Production

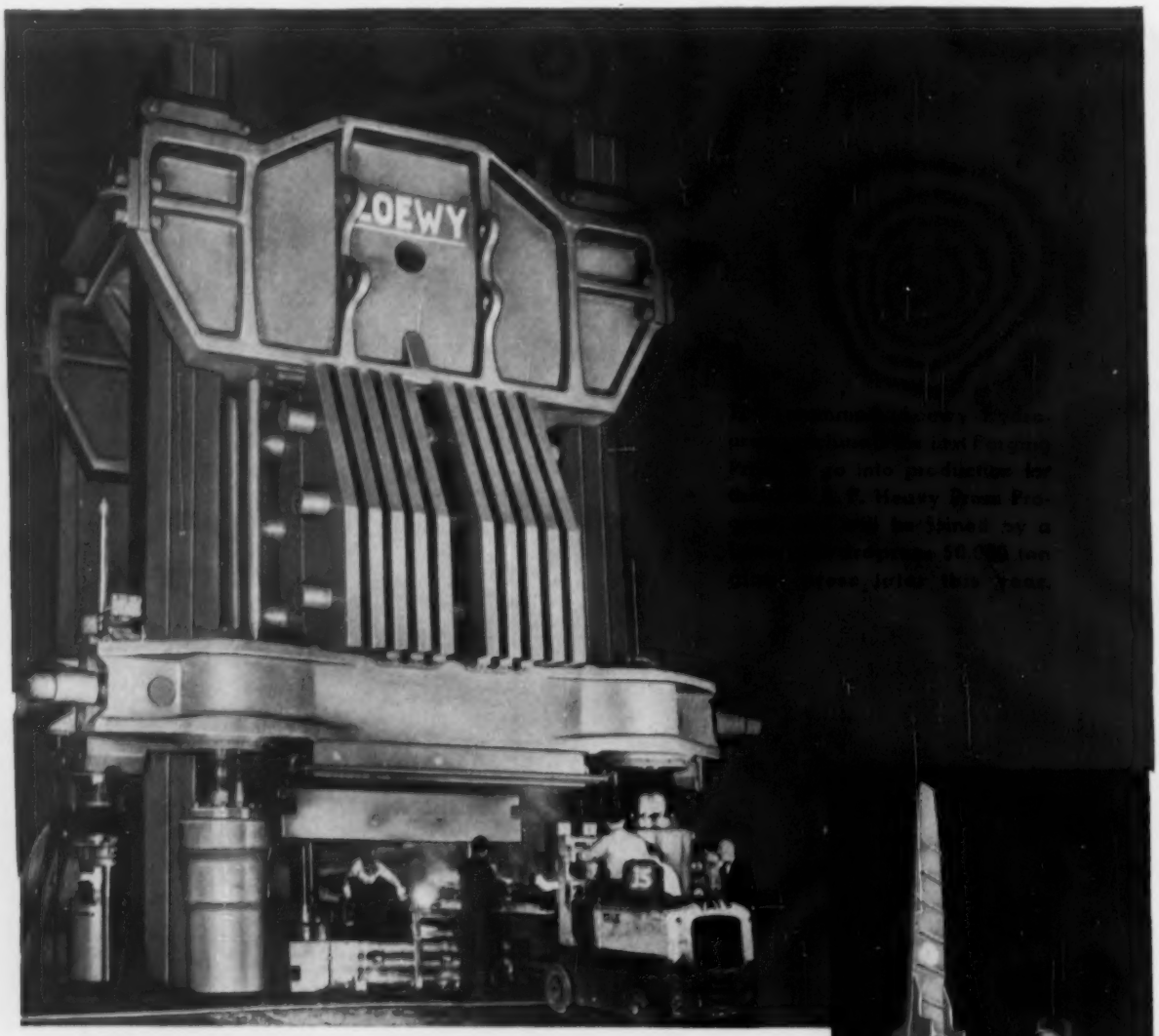
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
June 25, 1955	163,809*	33,463*
June 18, 1955	150,326	28,114
June 26, 1954	119,215	21,480
June 19, 1954	118,663	21,400

*Estimated Source: *Ward's Reports*

THE BULL OF THE WOODS — By J. R. Williams

O.K., I'LL PUT ERNIE RIEL RIGHT ON THIS!
I DON'T THINK YOU CAN CURE DESK SITTERS! TH' BULL OF TH' WOODS GOT A DESK SET TO KEEP 'EM OFF-- NOW LOOKIT HIM!
TH' GALS GET TIRED SETTIN' A TABLE ONLY THREE TIMES A DAY--HE'LL HAVE TO DO IT TEN TIMES!
6-30
J.R.WILLIAMS
THE PORTABLE FENCE



"Words cannot express how delighted we are with this wonderful engineering creation" says **WYMAN-GORDON** of the

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Forged Aluminum Wing Spar for Supersonic Aircraft.
This one-piece forging replaces conventional assembly of 272 parts, 3,200 rivets, and saves 100 lbs. of metal plus substantial man hours.

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Is Small Business on the Way Out?

GAW spells more trouble for hard-pressed small firms . . . New pacts demand big dollar reserves, place added premium on size . . . Merge, sell out or go under is the prospect for many—*By G. H. Baker.*

◆ LACK of blooming health among many of the nation's smaller companies vexes the government's antitrust experts. They're concerned that the anticipated spread of guaranteed-wage contracts spells rough going and even collapse for literally hundreds of independent firms.

Steep climb in the number of business mergers in recent years is a direct reflection of the cost squeeze that's pushing many independents off the map. Small companies in almost every industry are finding today that they must combine with competitors or sell out to the leaders in their industry in order to avoid extinction.

Influence to be wrought by guaranteed-wage plans is yet to be determined. No one in Washington pretends to know just what is added to a company's wage costs under a GAW plan.

Need Big Reserves . . . But studies of Ford and General Motors contracts being made by government labor experts indicate strongly that any company signing a GAW pact will necessarily have to have tremendous reserves of funds available in order to guarantee even 26 weeks of unemployment aid.

Joseph E. Moody, Southern Coal Producers' president and an expert in labor-management relations, contends that Ford and GM provided the opening wedge for a new kind of "fringe" benefit that will spread first throughout the remainder or much of the remainder of big industry and then inevitably will engulf small firms.

NEW ARMY HEAD: President Eisenhower congratulates Wilber Brucker, Ike's choice to succeed Robert Stevens as Secretary of the Army.

"Mr. Reuther has done a very dangerous thing, but he hasn't done it alone," Mr. Moody says. "When he got big management to join with him in establishing the principle of payments to guarantee against unemployment, the two of them gravely threatened the existence of small business—at least, small business competitive with big business

GAW Will Hit . . . AFL President George Meany declares flatly that the GAW principle "will hit practically every bargaining table in the next couple of years."

He says each industry will have to work out the application of guaranteed wages in its own way, but warns that his unions will now only accept GAW in new contracts.

Favor Bid Contracts . . . Smaller firms get a much better break from the government when they enter into advertised bid contracts rather than negotiated contracts, a new Senate report states.

Negotiated contracts impose "impossible" burdens upon small business, the Senate Small Business Committee protests. And it criticizes the Defense Dept. for stepping up the use of negotiated contracts, thereby crimping the ability of small companies to share in defense orders.

The committee says it is "disturbed" because less than 20 pct of defense dollars went to smaller firms in the fiscal year just ended. In the previous fiscal year, about 25 pct of the contract money went to small companies.

Down

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SELF LOADING & UNLOADING

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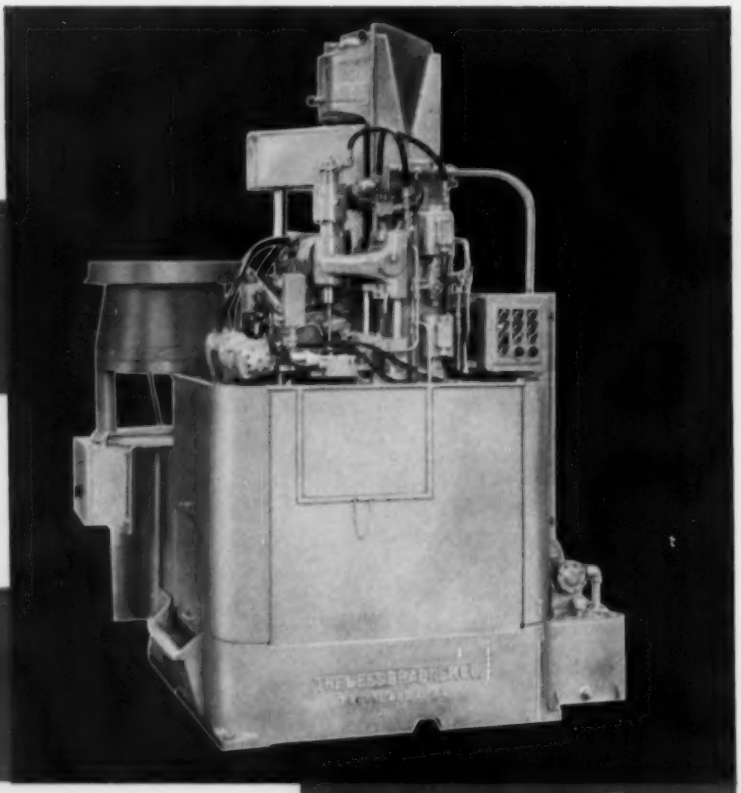

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MACHINES THAT THINK FOR THEMSELVES

Moving ever forward in the development of new gear-hobbing methods, Lees-Bradner now presents a hobber that *electronically* corrects tolerances while the machine is in action.

The secret lies in an "electronic brain" that checks the finished gears as they come from the hobber and makes corrections as necessary in pitch diameters or root fillets by electrically shifting the hob between cycles.

This is truly a revolutionary step forward in gear hobbing efficiency . . . time-saving as well as money saving.

If you, too, want to stop manufacturing "scrap" in your hobbing operations by catching off-tolerance pieces *before* they're hobbed, get the whole story from your Lees-Bradner representative. Or, write to us direct.

the LEES-BRADNER Company

CLEVELAND 11, OHIO • U.S.A.

Okay a Little Lying

▪ Employers and unions may properly lie to workers to influence them for or against a union, the National Labor Relations Board says. The board added in this unusual but unanimous decision that lying by either side is proper as long as it does not influence votes to landslide proportions.

▪ Says the NLRB:

"Exaggerations, inaccuracies, partial truths, name-calling, and falsehoods, while not condoned, may be excused as legitimate propaganda."
But the propaganda must not be "so misleading as to prevent the exercise of a free choice by employees in the election of their bargaining representative," the government lawyers held.

See Road Boom . . . Regardless of which highway construction program (Ike's plan or a Democrat substitute) is approved by Congress, you can safely bet that the next 12 months will see the start of the biggest, boldest road-building era the U. S. has ever known. Spending for new or better roads of about $10 billion a year, extending over 10 years or more, is being lined up for both superhighways and for secondary (farm-to-market) roads.

Details of financing the program are not yet jelled, but the probable method will be the issuance of special U. S. Treasury highway bonds (may call them "H" bonds) plus a 1¢-per-gallon rise in the federal gasoline tax.

Push Pension Aid . . . Support for legislation to permit millions of persons to reduce their income taxes by setting up self-financing pension plans is now coming from both parties on Capitol Hill.

Under the plan, tax benefits would go to all self-employed persons and all persons not now covered by pension plans by extending to individuals the tax deferment now allowed corporations which set up pension plans.

Measure, sponsored by Reps. Eugene J. Deogh, D., N. Y., and Thomas B. Jenkins, R., Ohio, would permit self-employed persons or others not covered by pension plans to defer taxes on 10 pct of their income, up to a maximum of $7500 a year, by putting it into qualified group or individual pensions, trusts, or insurance policies. The funds, and any interest, would be taxable when withdrawn after the individual reaches 65.

Persons using the system could not retain control of the funds deposited. There would be some savings because income would drop.

Substitutes:

Proposed program would push research on metals.

The White House is pressing Congress for permission to develop substitute metals and other materials, but it is increasingly evident that Congress won't agree quickly to the request.

Defense mobilizers, operating with White House backing, want to amend the Defense Production Act (it expires June 30) to permit the government to offer grants to university, private research groups, and industry, to speed development of substitutes for nickel, copper, cobalt, columbium, titanium, zirconium and silicon metals and alloys, plus glass fibre plastic compounds, synthetic fibres, cements, and chemicals.

"Wipe that smile off your face, O'Brien! You know very well that it's my turn to ride in the back."

Ease Trust Laws

Although most of the research would be confined to grants, the government "might find it necessary" to set up some pilot plant operations, but nothing like the synthetic rubber operations of World War II.

Two other amendments to the Act are being requested by the Administration. One would exempt from antitrust laws, as long as 20 years, any combined actions of companies to develop defense production. The other would expressly approve use of a reserve corps of industry, labor, and professional executives as advisers to the government to be pressed into service as dollar a year men.

A congressional bloc, headed by Sen. Wayne Morse, D., Ore., is objecting that government-sponsored research is too often paid for by the taxpayers, and then turned over to industry for profit.

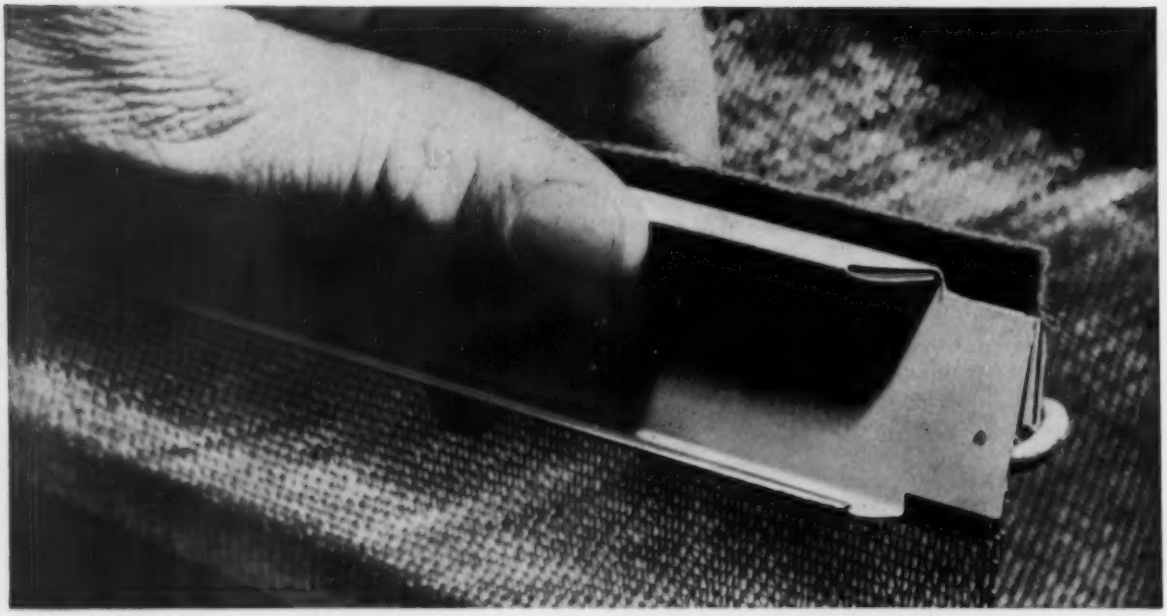
Study Truck Specs

Industry task groups are assisting the Defense Dept. this summer by analyzing proposed standard performance specifications for industrial power trucks to be bought by the military.

Engineers representing the producers are studying the specifications and will be joined in their meetings by Defense Dept. engineers.

Business and Defense Services Administration appointed the task groups, which will offer their recommendations to the power truck industry advisory committee working with BDSA.

Manufacturer *Bends* Enamelstrip 180° without paint cracking!



Sharp edges on bottom bar of roll-away screen are bent back double, and the felt insect-proof seal is bent 180°. Despite severity of bends, Enamelstrip coating withstands cracking and flaking.

Pre-Coated Coil Ups Sales of Roll-Away Window Screens

A serious sales problem was easily taken care of when the Rudiger-Lang Co. in California started fabricating the exposed metal parts of its roll-away window screens from Enamelstrip coil.

Previously, stores had to put Rudiger-Lang window screens on display with the exposed metal parts unpainted. Some of the edges were bent back double, which made it impossible to paint these parts of the screens before installing them.

After changing to Enamelstrip Pre-coated Coil, however, Rudiger-Lang was able to stamp out and bend parts 180° where necessary—without worrying about the paint cracking, chipping or flaking. The need to paint after installation was eliminated, and the sales appeal of the window screens on display increased considerably.

This story about product improvement is just one of the many that have been made possible by Enamelstrip. Today, hundreds of manufacturers are saving up to 50% on their production costs. They are feeding continuously from a coil of the exact size they need and reducing scrap losses . . . eliminating the expense of cleaning, tumbling, spraying, dipping, rust-proofing, baking, drying . . . making sure they won't be getting back any scratched or damaged products.

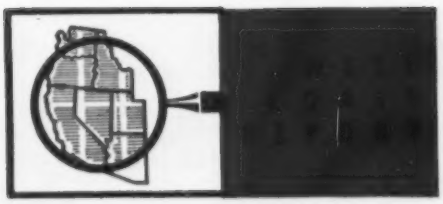
So why not let Enamelstrip show you how to make substantial savings on your costs? You can choose pre-coated coils in widths from 7/32 to 30 in. In steel, brass, zinc, aluminum, or any base material that takes a coating. In a wide variety of finishes. In colors from one end of the spectrum to the other. Just call or write.

Some of the other products being made from Enamelstrip today include: Tags, Toys, Screw Caps, Containers, Buckles, Appliance Accessories, Lighting Fixture Parts, Picture Frames, Envelope Clasps, Flashlight Batteries, Ash Trays, Movie Reels, Venetian Blinds, Electric Stoves, etc.

THE COATED COIL CORPORATION

511 West 30th Street, New York 1 • LOngacre 5-3161

National Sales Representatives for Enamelstrip Corp., Allentown, Pa.



Tax Aid Asked for More Aluminum

Kaiser plans three-fold expansion . . . Asks ODM for tax aid for financing . . . Would mean 95,300-ton jump in capacity . . . British Columbia industry is a big steel market . . . Industry coming —By *R. R. Kay.*

◆ MORE ALUMINUM reduction capacity, predicted by this column June 9, 1955, is now shaping up.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., plans a $104-million expansion. It would mean a 95,300-ton jump in annual capacity of primary aluminum. Company's current rate is 400,000 tons per year.

How far this plan goes depends pretty much on whether Kaiser gets a fast tax write-off. And maybe, to some extent, on long-term government market guarantees.

Certificates Asked . . . Company requests Office of Defense Mobilization certificates of necessity for:

(1) $52-million alumina plant with 438,000-ton annual capacity.

(2) $50-million aluminum reduction plant with 90,000-ton annual capacity.

(3) $2 million to add 5300-ton capacity to its 33,000-ton Tacoma, Wash., reduction plant.

There's no decision yet on locations for the new facilities. With Kaiser's bauxite coming from Jamaica, an eastern port city is a sure choice for the alumina plant. That would make the company's Ravenswood, W. Va., site a good bet for the reduction plant. There's plenty of room — 2500 acres—and a fully-integrated 125,000-ton-capacity rolling mill is already slated there.

Canada Booms . . . British Columbia is enjoying good business this year. And it looks like more of the same for 1956. The province is eating up a lot of steel, some 245,000 tons per year. The way things are humming, they'll need a lot more steel and metalworking equipment.

They're now using: bars, rods, light shapes—50,000 tons per year; medium and heavy structurals—60,000 tons; plates—20,000; sheet—28,000; tinplate—45,000; pipe and tubing—12,000; wire rods and wire products—24,000; bolts, nuts, nails—3000; and pig iron—about 2000.

An $11-million chlorine-caustic soda plant is coming to North Vancouver. Hooker Chemicals, Ltd., subsidiary of Hooker Electro-chemical Co., New York, expects to be producing by 1957.

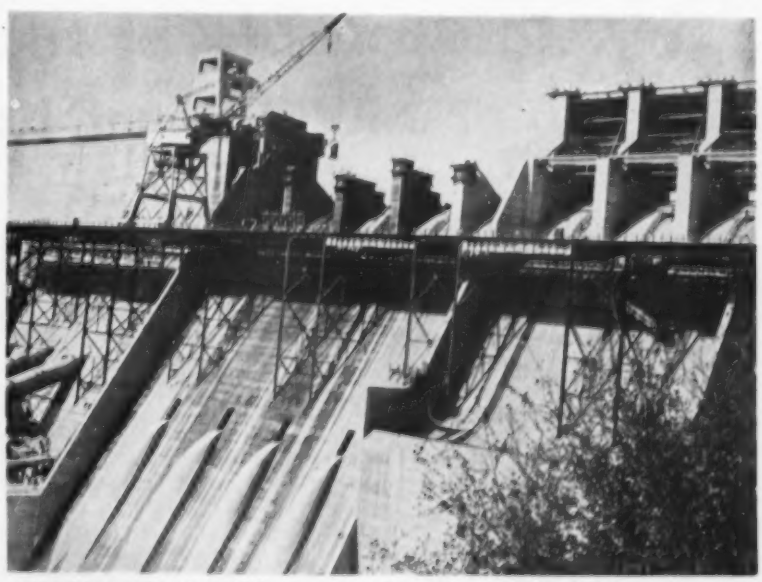
Steel plate fabrication facilities are getting a $1-million expansion at Dominion Bridge Co., Vancouver. And Lenkurt Electric Co., San Carlos, Calif., plans a $200,000 factory near Vancouver.

Plenty of Jobs . . . Are you fixin' to hire June graduates? You'd better treat 'em kindly. Job interviews are now a two-way street.

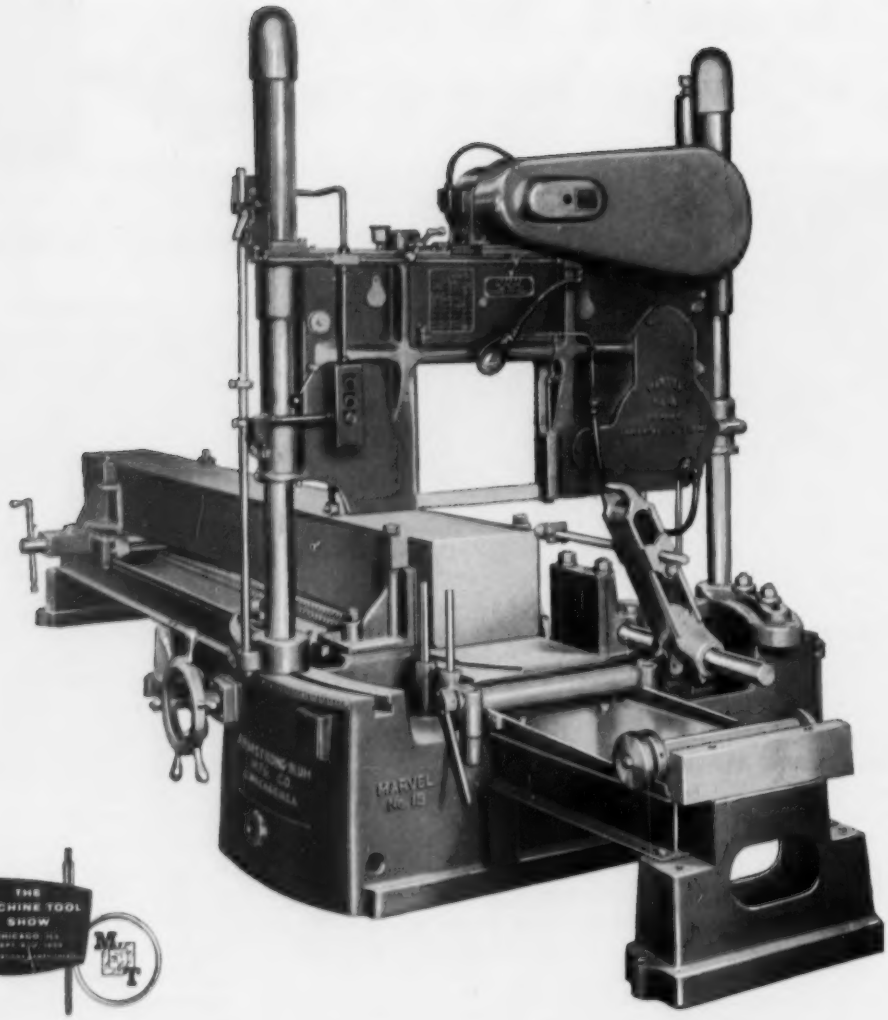
That's what John W. Adams finds. He's manager of the Bureau of Occupations, University of California at Los Angeles. Bureau services 35,000 students and employers a year.

Mr. Adams says the high-ranking graduate today averages six to ten job offers. So he's looking the job over as carefully as the would-be employer is looking him over.

Prospective employers will have to compete.



FOLSOM DAM in California rises above the American River in important power project. Steel gates were fabricated by U. S. Steel.



THE MACHINE TOOL SHOW

No Job too big or too tough . . .

for MARVEL "*Giant*" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18" x 18"; and No. 24, Capacity 24" x 24") were *basically* designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

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MARVEL *Metal Cutting* SAWS
Better Machines—Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

MACHINE TOOL HIGH SPOTS

Buyers Race to Beat Price Rise

Notice of coming increases brings big May spurt . . . New orders go over $72 million for 21-month high . . . Shipments show small gain . . . Another price hike due in September—By *E. J. Egan, Jr.*

◆ NOTICE of impending price increases from many machine tool builders caused a lot of wishy-washy prospects to make up their minds to buy last month. Result was that May sales of metal cutting machine tools hit a 21-month high at an estimated $72,150,000.

Sharpness of the sales spurt is indicated by the fact that new orders last month were almost $20 million above the April level, and almost $31 million above May, 1954, sales. Followers of the machine tool sales barometer have to trace back to August, 1953, to find the most recent period when new orders topped last month's. Volume then, reflecting needs prompted by the Korean episode, was $84,850,000.

May machine tool shipments are estimated by the National Machine Tool Builders Assn. at $53,450,000. This is only $200,000 above the April figure, shows that it will take a month or two more before the May boom in new orders can be converted to assembled machines on shipping room floors.

Buyers Move Fast . . . Getting back to the new order boom in May, there seems to be little doubt that notices of fairly widespread price boosts were chiefly responsible. Most of the increases were set to occur this month. Although many buyers placed orders in May, June sales should remain healthy because of last minute purchases to beat price deadlines.

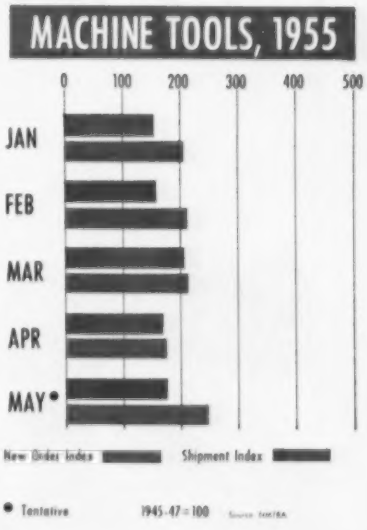
One large Eastern distributor of machine tools told THE IRON AGE that 10 of his 25 principal sources were involved in the recent price boost trend. Upward revisions ranged between 5 and 12 pct, averaged out at about 8½ pct.

More to Come . . . There is a theory that these recent increases in machine tool prices might cushion buyers for the price tags they'll find on new equipment at the Machine Tool Show in September. One source close to the industry expects that practically all of the modern tools to be displayed there will be about 15 pct higher than current comparable items.

Recent price boosts, as well as those coming up in September, reflect the higher cost of just about everything that is demanded on modern automatic metalworking machines. These components range from rough castings right on up to complex control and handling devices.

New level price tags might also reflect a realistic glance into the future, particularly where intricate machine assemblies are apt to require more specialized maintenance attention.

"Gee, I'm not sure I can handle it."



Builders pride themselves on their prompt response to customer demands for service. But if they can expect more of such demands in connection with their newest offerings, some provision for this increased service expense might be an item in new model prices.

Air Force Buys . . . Four U. S. machine tool builders have signed Air Force contracts to supply $11 million worth of milling and broaching machines. The companies, according to an official Air Force announcement are Onsrud Machine Works, Chicago; Farnham Div., Weisner-Rapp Co., Buffalo; Colonial Broach Co., Detroit; and The Lapointe Machine Tool Co., Hudson, Mass.

DoALL COMPANY ENGINEERS GET...

HIGH STRENGTH

with NO HEAT TREAT DISTORTION

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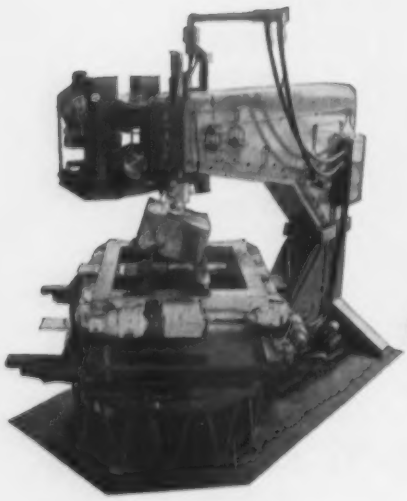
STRESSPROOF®

SEVERELY COLD-WORKED, FURNACE-TREATED STEEL BARS



The new giant DoALL Contourmatic band saw — the world's largest — is a key part of the Air Force's "Heavy Press Program." STRESSPROOF is used on important operating parts.

on key operating parts

The lead and feed screws on the new DoALL Contourmatic must be strong since they transmit power. These important lead and feed screws must also be straight and free from growth and shrinkage, since upon their accuracy depends the accuracy of the huge extrusion dies machined on the saw. STRESSPROOF gives them this strength and accuracy.

STRESSPROOF was specified because it eliminates heat treating and its attendant distortion and warpage problems. In addition, STRESSPROOF wears well, has the necessary strength and is easily machined.

STRESSPROOF makes a better part at lower cost.

Write for helpful data bulletin No. 15 . . . "Improve Quality — Cut Costs"

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MANUFACTURERS OF AMERICA'S MOST COMPLETE LINE OF QUALITY COLD-FINISHED STEEL BARS

The Iron Age

SALUTES

Horace Drever

A busy man in the industrial furnace field, he has won high honors and helped bring important improvements in the treating of steel but doesn't let business dominate his life.

Few men in industry today combine such a wide range of talents as this Philadelphia gentleman. He is at once one of the mildest mannered and most active of executives in the industrial furnace field.

Now president of the Industrial Heating Equipment Assn., he recently received the Trinks Award of *Industrial Heating* magazine, the nation's top honor for achievement in this field. He won it for development of the continuous vertical strip annealing furnace, for originating the current method of bright-annealing stainless steel wire and tubing, and for developing furnaces and quenching equipment for continuous heat treating of armor plate.

With all this you might assume that he'd spent most of his 61 years on the inside of furnaces looking out. Not so. Mr. Drever is primarily an outdoorsman—when he gets the time. And he *makes* a fair amount of time for hunting, fishing or just walking in the woods. Friends say that he probably gets more kick out of getting close to nature than he does out of actually bringing down a bird or netting a rainbow. And he's reputed to be quite an outdoors cook.

His favorite hunting spots include Arkansas, Cuba, South Carolina and Mexico. The latter has him particularly fascinated; he plans to go back soon and go after more wild turkey.

If you didn't know about his outdoor hobbies you might assume that reading was Horace Drever's No. 1 interest. Or selling; he runs his own concern—Drever Co., Bethayres, Pa.; still closes a lot of the bigger contracts. Or you might guess that European travel was a prime interest because he goes abroad a lot on business, has brought home several furnace ideas.

Horace Drever was born in Richmond, Va., still speaks with a trace of Southern accent, now lives with his wife and son in a Philadelphia suburb. He was educated at what was then Pennsylvania State College and served as an aviator in World War I. He'll readily admit to having been attached to the LaGuardia Squadron but few know he was one of our first Aces.

OXYGEN...unlimited

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When you make your own oxygen and/or nitrogen, your raw material costs you exactly nothing. And it is delivered to the generator without transportation charges. Furthermore, the supply is unlimited and cannot fail you, even temporarily, because of bad weather or carrier breakdown.

Your raw material is the free air around you—many, many billions of tons of it—as much as you can use for the asking. Another important point—you can take advantage of nature's abundant generosity without capital investment by installing an Air Products Multiple Generator on a lease basis.

We provide:

Large Capacity Tonnage Generators for unlimited quantities of oxygen and nitrogen, in standard or special models, high or low pressure cycles

and

"Packaged" High-Purity Generators, producing high-purity oxygen and nitrogen simultaneously or individually.

Tell us what you need. We can quickly give you actual figures on the savings you can make.

More than 100 Air Products engineers are at your service.

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OXYGEN...NITROGEN

The Iron Age INTRODUCES

CARL McFARLIN, SR., elected executive vice-president, Merritt-Chapman & Scott Corp., New York.

M. T. O'Donnell, named vice-president, and **Clare E. Briggs,** elected vice-president—sales, Chrysler Div., **Chrysler Corp.,** Detroit.

R. Lindley Murry, elected chairman of the board, **Hooker Electrochemical Co.,** Niagara Falls, N. Y.

Grosvenor S. McKee, elected to board of directors, **Van Norman Company,** Springfield, Mass. **Dr. John W. Harriman,** also elected to the board of directors.

J. D. Dickerson, appointed to the staff of the Central Operating Department, **Crucible Steel Co. of America,** Pittsburgh. **C. S. Walton** was named as Chief Metallurgist at Midland works.

Thomas G. Lewis, appointed assistant to director of purchases, **Youngstown Sheet and Tube Co.**

Vernon A. Dupy, appointed director of purchasing, scheduling and warehousing operations, United Motors Service Div., **General Motors Corp. Edward L. Lape,** named general sales manager.

Charles B. Buker, appointed supervisor—product technical services, Strip Mill and Tin Mill Products Section, Technical Services Div., **Jones & Laughlin Steel Corp.**

William H. Thomas, named new director of the General Industrial Equipment Div., **Business and Defense Services Administration,** Washington, D. C.

M. W. Anderson, named manager, accounting research, **Crucible Steel Co. of America,** Pittsburgh. **George W. Brooks** becomes works controller—Park and Spring works in Pittsburgh. **E. M. Kuza** will become general supervisor of cost accounting at the Park works. **Donald D. Bowser,** named chief cost accountant at the Midland, Pa., works.

Gen. Matthew B. Ridgeway, named chairman of the board of trustees, **Mellon Institute of Industrial Research,** Pittsburgh.

Edward Gray, named assistant chief engineer—production engineering, Chevrolet Motor Div., **General Motors Corp.,** Detroit.

William A. Baldwin, named sales manager—Nailable Steel Flooring Div., **Stran-Steel Corp.,** Detroit.

Melvin F. Auch, named assistant general purchasing agent—administration, and **Gordon K. Price,** named assistant general purchasing agent—production, **Chrysler Corp.,** Detroit.

Thomas P. Rhoades, appointed director—public relations, **Campbell-Ewald Co.,** Detroit.

Dr. Lawrence R. Hafstad, named director of research staff, **General Motors Corp.,** Detroit.

A. L. Stewart, named regional representative—crushing, cement and mining industries, **Allis-Chalmers Manufacturing Co.**

BURNELL VERNER, elected vice-president, Lurie Brothers, Philadelphia.

JACK L. GORDON, elected vice-president, Lurie Brothers, Philadelphia.

THOMAS L. HUMBEL, elected vice-president and general manager—production, Aluminum Industries, Inc., Cincinnati.

W. H. Lee, appointed manager—government sales and contracts, **Electric Products Co.,** Cleveland.

Oscar L. Maag, named engineering consultant, **The Ironsides Co.,** Columbus, Ohio.

Robert G. Shrake, appointed assistant district sales manager, **Republic Steel Corp.** in the Cincinnati sales district.

Anthony J. Jasinski, appointed administrative assistant—Milwaukee plant, Tubular Products Div., **Babcock & Wilcox Co.**

M. S. Gettig, named assistant general superintendent — steel plant, Indiana Harbor Works, **Robert V. Cordingley,** named assistant general superintendent of the strip and tinplate plant, and **Earl W. Mahaney,** named assistant superintendent — metallurgical department — Chicago district, **Youngstown Sheet and Tube Co.**

Claude E. Davis, named manager—packing and special products sales, **Goodyear Tire & Rubber Co.,** Akron, Ohio.

Joseph T. Bailey, appointed general manager — outdoor lighting department, **General Electric Co.,** Lynn, Mass.

Joseph L. Schneider, named assistant comptroller and **Charles F. Fincher** has been made assistant general works auditor, Tennessee Coal & Iron Div., **United States Steel Corp.,** Birmingham.

L. Webster Madery, appointed to the newly created post of assistant to the general sales manager, Dodge Div., **Chrysler Corp.,** Detroit. **Thomas W. Cuthbertson** appointed planning coordinator, **Wayne T. Diehl** appointed manager of industrial relations, **Robert W. Kennedy** appointed comptroller, and **Paul M. Nash** named director of forward planning, Supply Div., **Otto W. Franke** was named manager of the newly created Central Production Engineering Department.

Major-General Frank H. Lamson-Scribner, named executive associate to the president, **Onsrud Machine Works, Inc.,** Niles, Ill.

F. P. von Meyer, appointed production manager—Manufacturing Div., **W. H. Anderson Co., Inc.,** Detroit.

William R. McMillen, appointed regional sales manager — southeastern U. S., **Breuer Electric Mfg. Co.**

Joseph G. Hrosenchik, named district sales manager, **DeWalt Inc.,** Lancaster, Pa.

Emo D. Porro, appointed engineering assistant to the director, **Stanford Research Institute,** Menlo Park, Calif.

William B. Womack, appointed general plant manager, **Cook Heat Treating, Inc.,** subsidiary of **A. F. Holden Co. Earl G. Leas** appointed vice-president—sales. **Ray Lowman,** appointed plant superintendent. **William T. Mullin** will head the sales engineering staff and **Richard S. Smith, Jr.,** has been appointed district manager.

George H. Compter, appointed consultant on Synchros and Servo Devices - Electrical Equipment Div., **Business and Defense Services Administration.**

William H. Duckworth, named to serve the metal industries in South Milwaukee, **Oakite Products, Inc. George F. Becker** named representative in metal industry in Kansas City, Missouri. **Raymond Abazia** has been transferred to Brooklyn-Queens area in New York City, and **H. Wilder** was transferred to the Akron, Ohio, territory.

Robert M. Johnson, appointed district sales representative, Leschen Wire Rope Div., **H. K. Porter Co., Inc.**

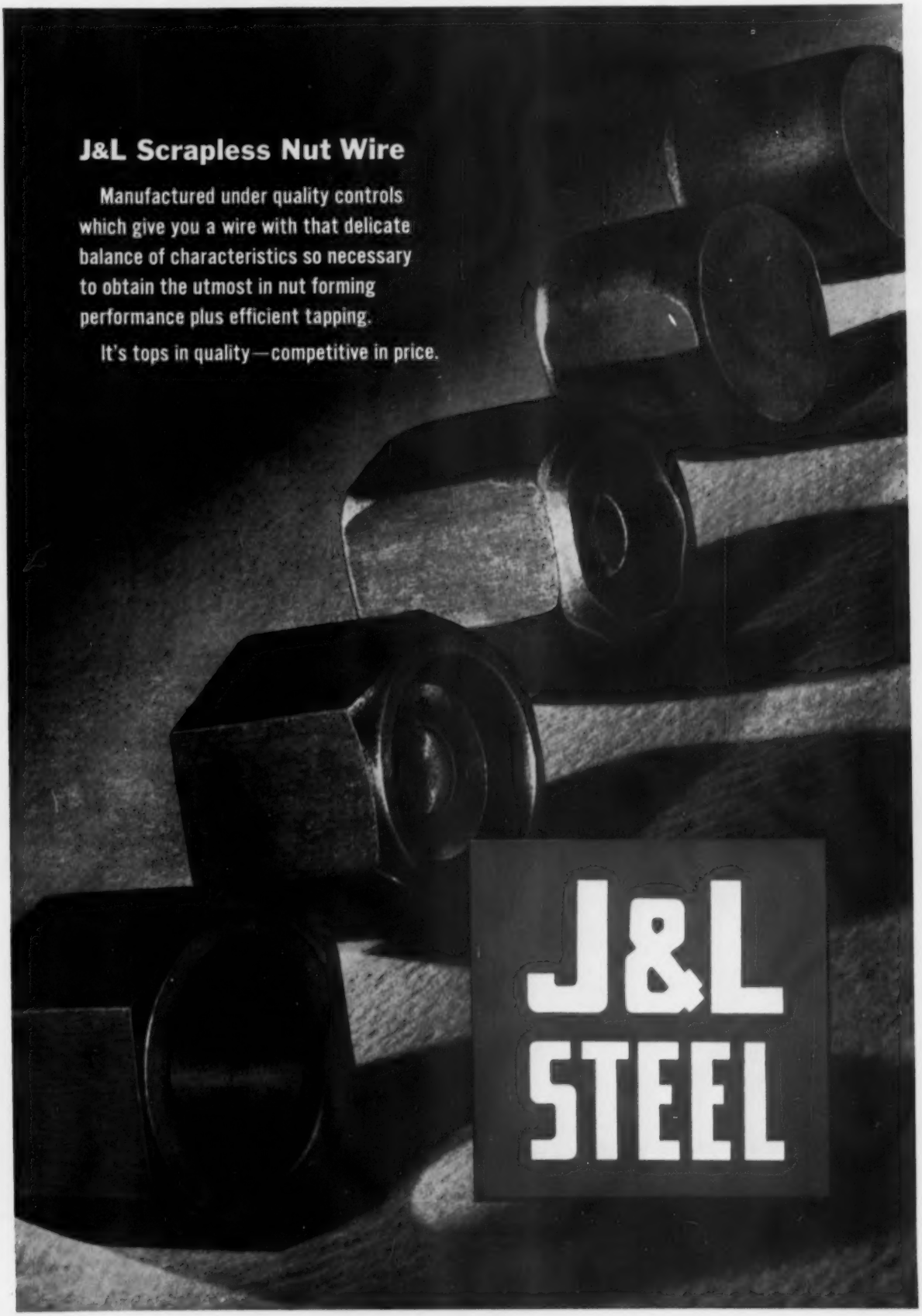
George F. Groff, appointed secretary, **Crucible Steel Company of America,** Pittsburgh.

A. M. KENNEDY, JR., appointed general manager, purchases and traffic, Westinghouse Electric Corp., Pittsburgh.

E. W. ADAMS, appointed plant manager, Kaiser Aluminum & Chemical Corp., Columbiana, Ohio.

C. ROGER SUTTON, joined the Development and Research Div., International Nickel Co.

FRANCIS J. BRICKLE, appointed district manager—P & H Crane & Hoist Sales, Harnischfeger Corp., Milwaukee.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Joseph F. Kempf, Jr., named manager of the Penn-Jersey district, Lamp Div., **Westinghouse Electric Co. Daniel R. Thomas,** named manager of the Lake Erie district. **Bruce D. Henderson,** named to the apparatus products staff.

Henry H. Lentzner, appointed vice-president — manufacturing, **Kearney & Trecker Corp.,** Milwaukee.

George T. Boscoff, appointed sales manager, **Pyrosil, Inc.,** Cuyahoga Falls, Ohio.

Robert G. Callison, elected vice-president—regional sales and sales promotion, **Peters-Dalton, Inc.,** Detroit. **T. Kenneth McGuire,** appointed general sales manager.

Joe E. Tracey, named Rocky Mountain representative, Industrial Products Div., **Pioneer Rubber Co.**

R. B. Preston, appointed west-central manager and national accounts regional supervisor, **Detrex Corp.,** Detroit.

Vernon R. Quinby, appointed division manager, Industrial Associates Div., **Dumond Aviation Associates,** Long Beach, Calif.

Francis G. Murray, Jr., named sales representative — Baltimore, **National U. S. Radiator Corp.,** Johnstown, Pa.

Emil J. Koe, promoted to the position of director of industrial relations, **Illinois Tool Works.**

Robert F. Jones, named executive assistant to vice-president—engineering, **TEMCO Aircraft Corp.,** Dallas.

John W. Luke, appointed applied science field manager, **International Business Machines Corp.,** Los Angeles, Calif.

LEON B. WOHLGEMUTH, appointed sales manager—middle states, Tubular Products Div., Babcock & Wilcox Co.

THOMAS E. WILLIAMS, appointed general superintendent — West Coast plants, Joseph T. Ryerson & Son, Inc.

DAVID L. AMMEN, appointed executive assistant to the president, Barry Controls Inc.

C. R. JONES, appointed manager —western Canada, Cooper-Bessemer of Canada Ltd.

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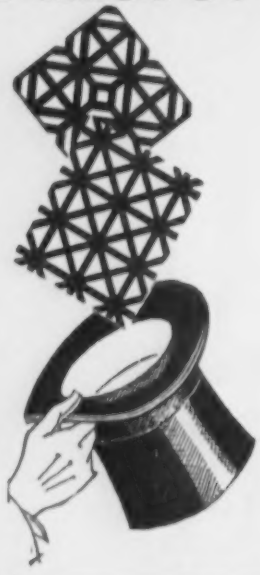

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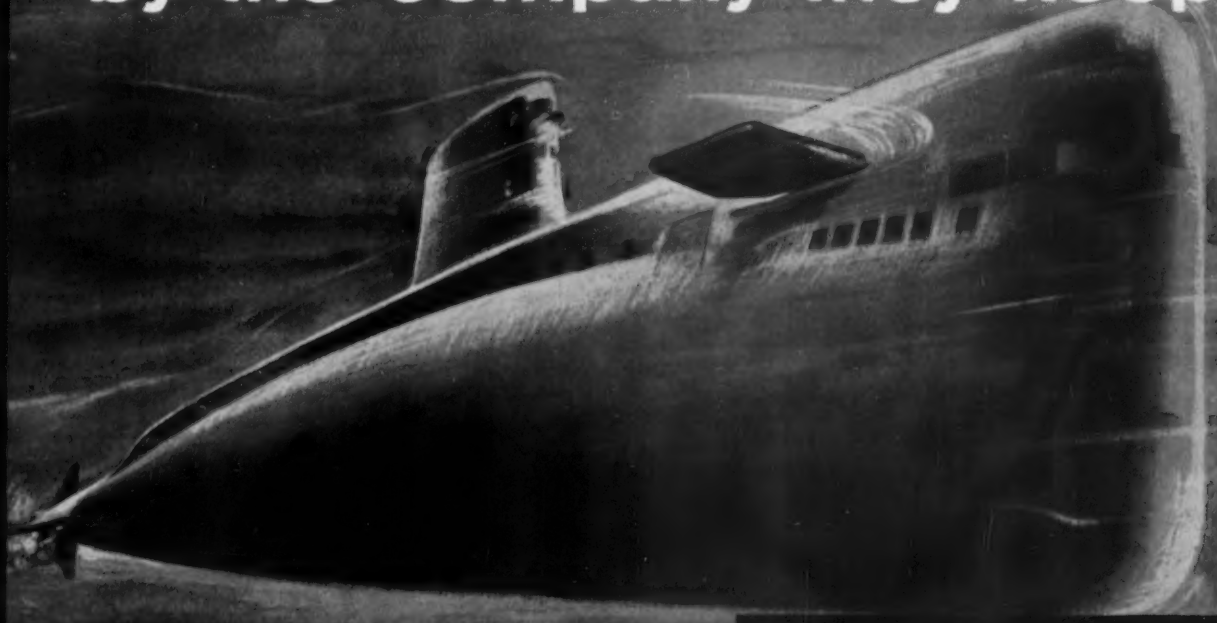

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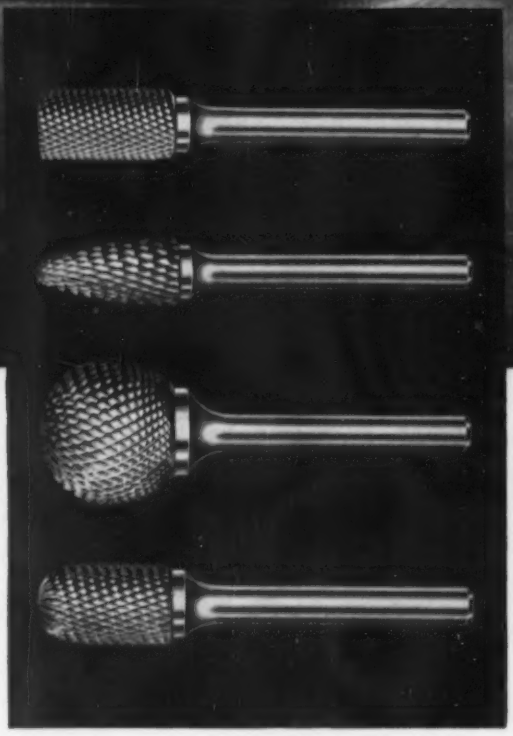

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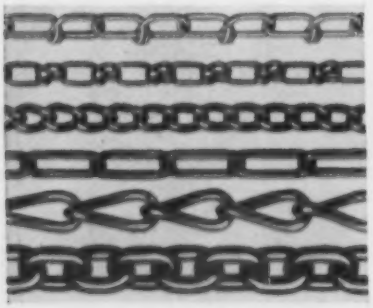

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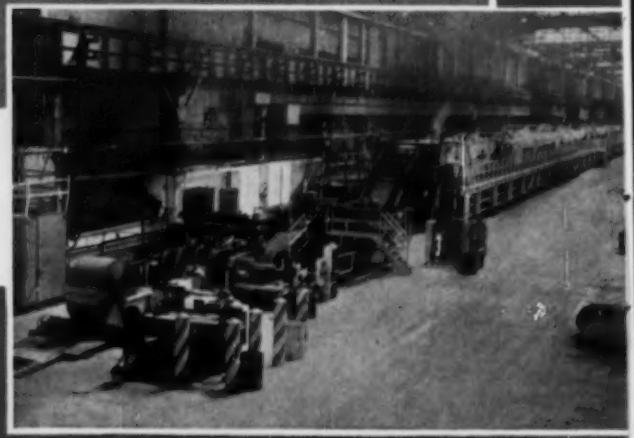

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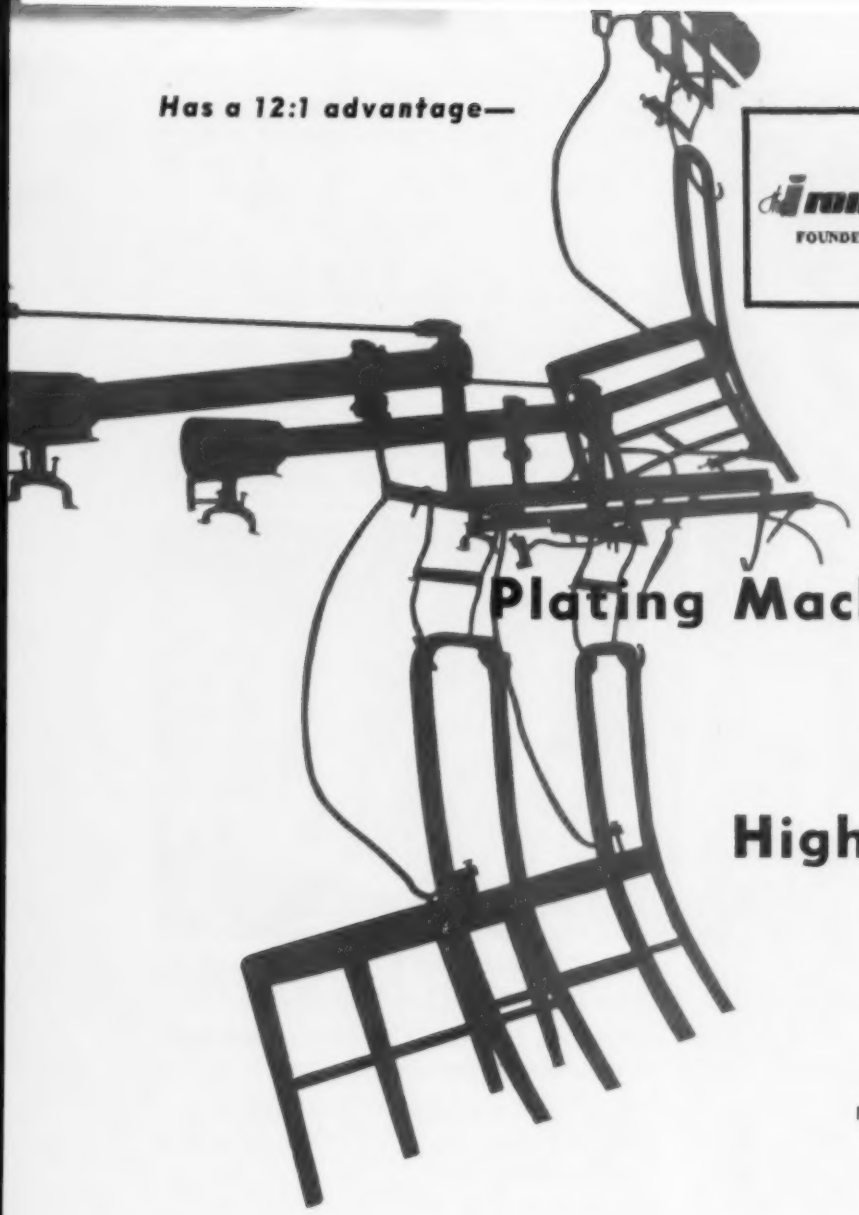


Plating Machine Design Leads to High Anodizing Rates

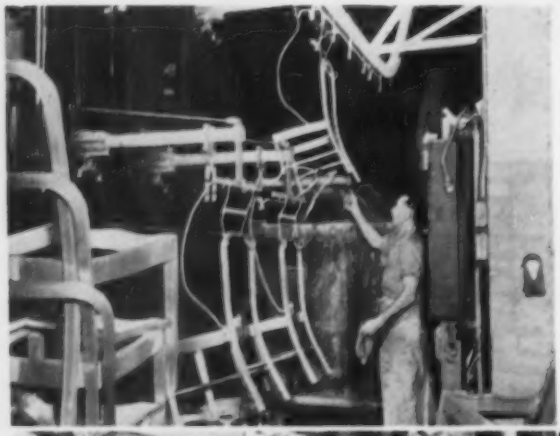
By PAUL PEARSON, Supervisor of Finishing,
Art Metal Construction Co.,
Jamestown, N. Y.

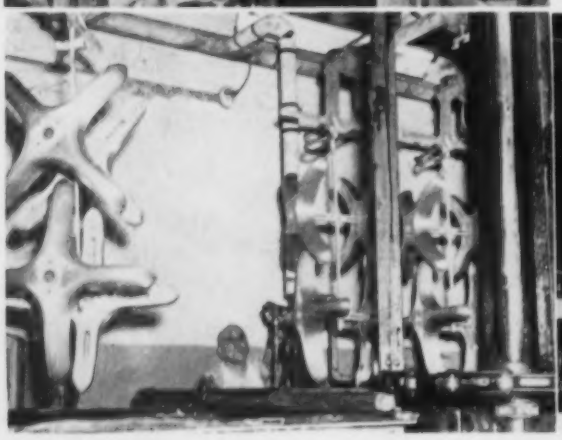
◆ An anodizing setup, based on a return-type electroplating machine design, is turning out 12 times as much work as normally done by manual processing . . . With it, one man anodizes from 24 to 60 carrier loads of aluminum chair parts per hour.

◆ Coating uniformity and quality are considerably superior . . . Maintenance is negligible . . . Being custom built, the system makes good use of floor space . . . Anodizing output keeps well ahead of the fabricating departments' production.

◆ SPEED, economy and product quality are the major benefits derived from a new installation for anodizing aluminum chair parts at Art Metal Construction Co., Jamestown, N. Y. With it, one man is doing the work which would normally require 12 men. The installation based on plating machine design, is fully automatic and believed to be the only one of its kind used for anodizing.

Previously, Art Metal bought chairs to go with the office desks and tables it manufactured. Selection of equipment for anodizing became a problem since the firm lacked experience in the details of the process. Nevertheless, certain minimum requirements had to be met. Excellent uniformity of finish was one. There were also the considerations of space and allowable resources.





Top-Left: **ANODIZING begins and ends at this loading station. First tank holds an alkali cleaner.**

Above-Left: **ELEVATOR-TYPE conveyor raises chair parts to transfer them from one tank to another.**

Above-Right: **MAINTENANCE of solutions presents no problem. Occasional checks assure good coating quality.**

In the light of these factors, an automatic conveyor that anodizes a unit load of aluminum parts in approximately 80 minutes was designed, built and installed by the Hanson-Van Winkle-Munning Co. It is of the elevator, return-type design. Its production rate is optional from 24 to 60 carrier loads per hour, depending on the oxide coating thickness desired. The one man who operates the system loads the conveyor, then unloads it at the end of the anodizing cycle.

Elements of this automatic anodizing setup are a conveyor, a remote control panel, a motor-generator set and seven tanks of varying sizes and construction to hold the various rinsing baths and anodizing solutions.

The conveyor employs separate forward and elevator lift drives. It has 44 carriers, each capable of holding a maximum of 30 lb of 61ST aluminum alloy chair parts. A carrier can handle several parts where weight and space permit. For example, one carrier will hold one assembled leg chair, four swivel-chair bases, six backs of arm-type leg chairs or 40 leg brace pieces.

The entire system will process a total anodized area of about 670 sq ft per hour. Current for the anodizing operation is supplied by a 400-amp, 25-v motor-generator set.

Transfer time (forward movement) from station to station is 30 seconds. The immersion period, controlled by the elevator drive, is 80 seconds, although this may be adjusted from the control board to a range from 30 to 120 seconds. A 48-in. vertical movement of the elevator assures total immersion of parts. Car-

riers are spaced 30 in. apart, permitting a load width of 24 in. and a 6-in. clearance between carriers.

Seven tanks are used in the system to clean, rinse, anodize and seal the parts. All tanks are made of ¼-in. steel plate except the hot water seal tank which is lined with stainless steel. Temperature controls maintain proper temperatures accurately throughout the system. Stainless steel down-draft exhaust hoods and suitable fans provide proper and adequate ventilation.

The entire system is automatic. All controls are on a control board near the loading station within easy reach of the operator. This remote control panel has stop and start buttons, on and off lights, starting controls for the forward and vertical conveying motors and a cam-operated electric timer to control start and stop motions. Also provided are cutouts for electric switches and an electrical timer for varying immersion time.

At the loading station, the operator places the aluminum chair parts on the carrier. The parts first move to the alkali cleaner tank on a conveyor after which the elevator lowers them into the cleaner. The alkali cleaner solution is maintained at 200°F by a steam heating coil mounted on the tank wall.

Processing time in the cleaner is 5 minutes. After 80 seconds immersion time, the material moves forward but does not leave the tank. At the end of the cleaning period, the elevator lifts the parts from the tank and carries them to an 80-second cold water rinse and top spray bath.

Coating takes 30 minutes

Parts are then moved to the anodizer tank. This tank, which is 40 ft 3 in. long and 4 ft 6 in. wide, contains a sulphuric acid electrolyte bath held at a temperature of 70°F. This temperature is maintained by 1800 ft of lead cooling coils meshed along the sides of the tank. An air agitation coil is also mounted on the bottom of the tank. Immersion time to apply the protective anodized coating is 30 minutes.

Next, the carrier lifts the parts from the anodizer and carries them through three cold water rinse and top spray tanks for 80 seconds in each. Material to be dyed is removed from the system at this point. After dyeing, it is returned to the cycle. Otherwise, parts move automatically to the hot water sealing tank. Sealing time is 30 minutes. Water in this tank is heated by five aluminum steam heating coils consisting of 250 ft of 1¼ in. IPS type 3S aluminum pipe. After sealing, material is carried back to the loading station for inspection and unloading.

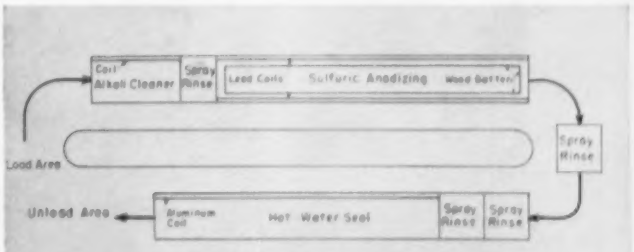
The entire anodizing system is housed in a specially constructed room 150 ft long by 20 ft wide. Since the entire system was custom built, it was possible to preassemble many of the ventilation and exhaust system components. Also, being custom built, the system fits the needs and limitations of space and economy.

Since the system has been in operation there has been no mechanical breakdown of any kind. Maintenance has been negligible. In addition to operating economy, the system provides high quality and uniformity of the anodized product. Because the timing mechanisms assure identical immersion periods for each part, the stability of processing is such that it cannot be obtained by manual operation.

With automatic equipment, production is considerably higher and one operator can handle the installation without difficulty.

The company estimates that the saving in manhours alone, compared to manual processing, is about 1200 pct. Rapid flow of material through the anodizing process requires a continuous flow of parts from the chair fabrication departments. The installation also serves as an important selling point with prospective customers. Automatic anodizing has resulted in better and more uniform protection.

OVERALL view of the conveyor shows the sulphuric acid section where anodizing takes place. Down-draft exhaust removes fumes.



LAYOUT of anodizing system consists of seven tanks. A complete cycle takes about 80 minutes. The equipment is capable of anodizing about 670 sq ft per hour. The system is automatic.

Light, strong, inexpensive—

How and Where to Use Plastic Fixtures

◆ Laminated and cast plastic welding fixtures are usually simple to make, offer important savings where conditions permit their use . . . At Convair's Fort Worth Div., they have proven their worth in rugged production tests.

◆ Plastic tooling is lightweight and strong, requires a minimum of design and machining time . . . Fixtures are readily made to the desired accuracy, and once formed, they retain their dimensional stability.

By G. R. GORDON, Asst. Chief Tool Engineer, Manufacturing Research, Convair Div., General Dynamics Corp., Ft. Worth Tex.

◆ PLASTIC WELDING FIXTURES offer worthwhile savings where range of temperature, application and configuration permit their use. Construction of these tools is usually simple, requiring a minimum of design and machining time. This can mean savings of 33⅓ to 50 pct compared with conventional methods.

Welding tools fabricated from plastic materials are light in weight and strong; they are also easy and inexpensive to maintain and repair. From a precision standpoint, such tools are easy to form to the accuracy required. Once formed, they retain dimensional stability.

At Consolidated Vultee Aircraft Corp.'s Fort Worth (Tex.) Div., plastic welding fixtures have been production-tested since 1951. These tools and fixture combinations have been used for gas tack and seam welding, spotwelding, assembling, "Clecoing," and a variety of other operations including checking, trimming, drilling and routing. Results have been excellent, and the firm's manufacturing research and development department has recommended wider use of plastic fixtures.

Basic materials for Convair's plastic fixtures include: (1) polyester and epoxy laminating resins, phenolic and epoxy laminating resins and forming resins; (2) tubes and fittings made of fiber glass and epoxy resin; (3) tooling type fiber glass cloth; (4) Masonite, Hi-Den, paper base phenolic sheets and similar materials from ½ to 1¼ in. thick; (5) metal supporting materials such as bolts, nuts, dowels, bushings, locators, clamps and other items.

Use laminates for some parts

Epoxy and polyester laminating resins are best suited to the type of tool construction shown in Figs. 1, 2, 3, 4 and 5. The tool in Fig. 1 was constructed on a finished part which had been thoroughly cleaned, sprayed with a releasing agent, and then waxed and polished to a high luster prior to layup. These fiber glass parts

FIG. 1—Epoxy laminated gas tack weld and check fixture was laid up on a finished part.

FIG. 2—Spotwelding tools made by machining epoxy laminated sheet materials as required.

FIG. 3—Indentures in this laminated assembly and spotweld fixture are metal-supported.

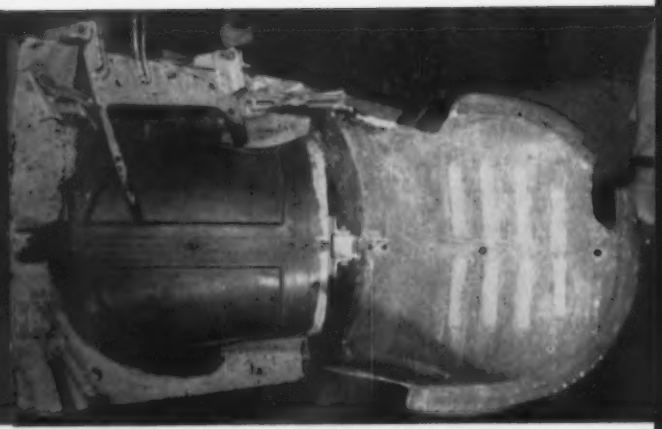


FIG. 4—Assembly and Cleco fixture has a cast phenolic core, epoxy laminated shell.

were then trimmed to size, allowing ample clearance in the weld areas. The finished parts were attached to a ½ in. Masonite base with suitable blocks and the necessary clamping and checking facilities were added to complete the tool.

The spotwelding tools in Fig. 2 were fabricated by machining epoxy laminated sheet material to the required specification. In assembling the details, certain metal supporting materials were used to complete the tool.

The assembly and spotweld fixture in Fig. 3 was fabricated from a carefully prepared finished assembly. After the laminate cured, it was machined to allow for clearance and tack spotwelding. Metal supporting materials were then added in the indenture areas and around the outer perimeter to provide additional locating facilities. Indentures for the various details were painted different colors and the part numbers were stenciled in the proper areas.

Figure 4 shows an epoxy laminated drill shell which was fabricated to drill detail holes and "Cleco" holes in the assembly as required. This tool also has a cast phenolic core attached to the base.

Epoxy type gives smooth finish

In the Fig. 5 example, a surface coat of epoxy "room set" resin was added to a prepared assembly to produce a smooth surface finish on the locating faces of the tool. A layup was then made to the required thickness, giving support to these areas. For the supporting structure, plastic tubing and fittings were bonded with fibre glass and epoxy resin. Metal dowel pins, bushings, locator buttons, and clamping facilities were added as required.

Cast phenolic resins are best suited to the type of tool construction showns in Figs. 6, 7 and 8. The welding fixture in Fig. 6 has a solid-cast phenolic core. Weld clearance on the corners of the core was provided for when it was cast.

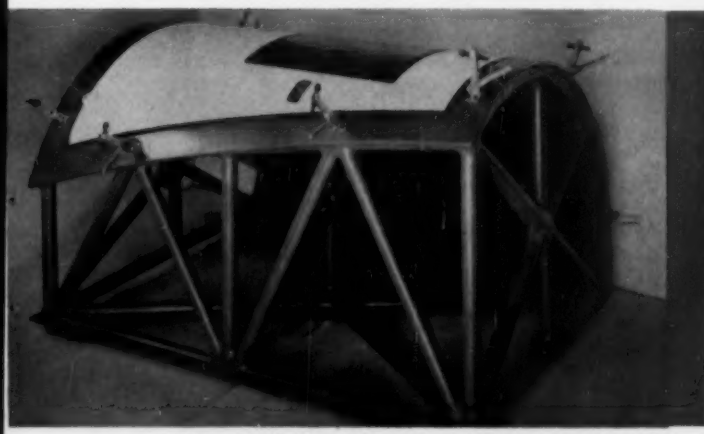


FIG. 5—Plastic tubing and fittings support this assembly and fixture.

FIG. 6—Gas welding fixture has a solid core of cast phenolic on a Masonite base.

"Experience shows that little hazard exists when plastic fixtures are exposed to the direct heat of a welding torch flame . . . Although the plastics will not support combustion, they will char . . ."

Metal supporting materials and a Masonite base complete the tool.

Figure 7 shows a cast phenolic nesting type weld fixture that was cast from a prepared sample part. Clearance in the weld areas was cast into the tool by forming molding wax (clay or other materials could have been used) onto the sample.

Use the part as a pattern

To make right and left hand casts, Phenolic resin was first poured into a box prepared with a releasing agent. The sample part, also coated with a releasing agent and with the ends of the tubes flush-plugged, was then suspended in the resin to a depth slightly less than one-half the diameter of the tubes. The part was then secured in place until the resin cured, after which the sample was removed and the casts cleaned up to allow for part clearance at the tube ends. The casts were then attached to a ½ in. Masonite base and metal supporting materials added as needed.

In Fig. 8, a cast phenolic core was made to the inside of the part in such a manner as to adequately locate the required number of details. The core is not attached to a base but is clamped in a cradle used only as a holding device. Necessary metal supporting materials complete the tool.

Experience shows that little hazard exists when the plastic fixtures are exposed to the direct heat of a welding torch flame. But although these plastics will not support combustion, they will char.

Convair's manufacturing research on plastic fixtures points to increased use of these techniques by production tooling personnel.

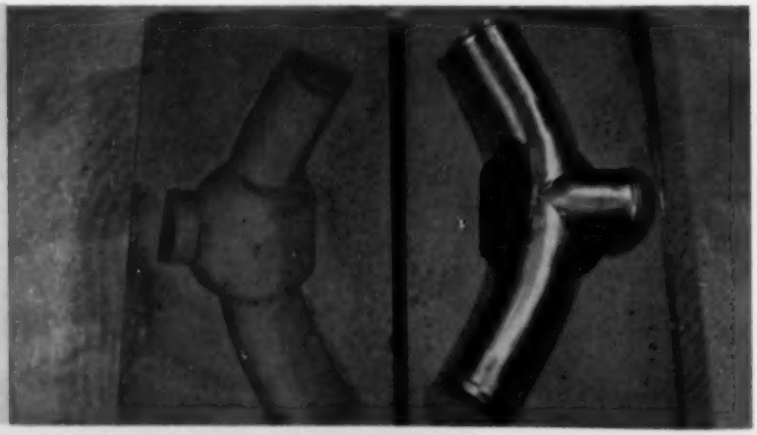
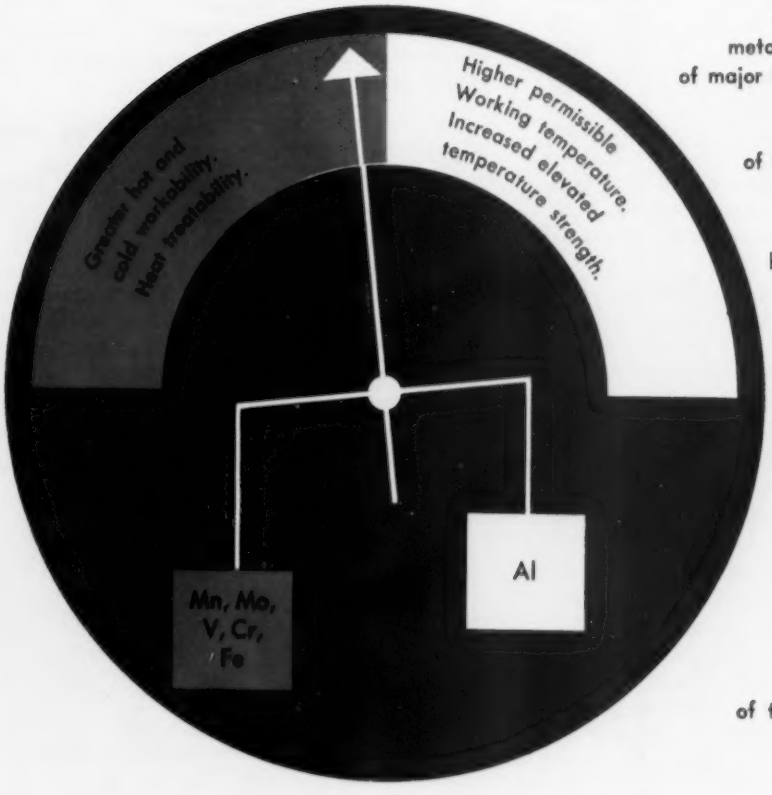


FIG. 7—Right and left hand phenolic casts for the weld fixture were made from a sample part.

FIG. 8 — Assembly and fixture. A cast phenolic core is used to locate required details.

Simplify Approach to Titanium Heat Treatment

By P. D. FROST, Chief, Light Metals Division, Battelle Memorial Institute, Columbus, Ohio


Higher permissible Working temperature. Increased elevated temperature strength.
Greater hot and cold workability. Heat treatability.
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◆ A simple analysis of the metallurgy of titanium alloys is of major importance to the titanium fabricator . . . It allows him to make better use of these materials in the heat treated condition.

◆ Understanding the behavior of titanium alloys, their susceptibility to "omega" embrittlement, is important in hot forming and heat treating . . . This article tells "why" in terms the fabricator can understand.

FIG. 1—Aluminum and transition elements alter certain properties of titanium. Alloy choice must be based on the application requirements.

◆ ONE WAY to get the most benefit from commercially available titanium alloys is to learn how to use them in the heat treated condition. Most of these materials are now being used in the annealed condition, although many can be heat treated. Heat treating strengthens these alloys, just as it does aluminum or steel.

The metallurgy of titanium is not simple, but many of its principles can be reduced to understandable terms. The function of the alloy "stabilizers" is a case in point. Fig. 1 shows that beta phase stabilizers give titanium the ability to be strengthened by heat treatment. It also notes which elements are used for this purpose.

Alloys containing only alpha stabilizers—aluminum, tin, carbon, oxygen, or nitrogen—are not heat treatable in the usual sense. The A110AT alloy, for example is an all alpha material containing both aluminum and tin. It derives its strength from the solid-solution strengthening effects of the aluminum and tin.

Aluminum-containing alloys retain their strength at higher temperatures better than alloys without aluminum. This behavior also makes alloys with aluminum more difficult to work. One advantage of aluminum in forging, rolling, and heating is that it permits the use of higher finishing temperatures.

The interstitial elements—carbon, oxygen, and nitrogen—need not be considered in detail because they are generally undesirable in alpha-beta alloys. They do strengthen the alpha phase,

but they have harmful effects on ductility and impact properties. They do not promote heat treatability.

The selection of commercial alloys for any application should be based on the conditions to be satisfied. If maximum stability at temperatures above 800°F is required, a logical choice would be the alpha-stabilized Ti-5Al-2.5 Sn alloy (A110AT). If reasonable stability and high strength at temperatures up to 800°F are needed, the Ti-8Mn, Ti-3Mn-complex, Ti-4Al-4Mn, Ti-6Al-4V and other comparable alloys would be suitable if properly heat treated.

Why heat treating helps

When maximum formability is most important, unalloyed titanium or the Ti-3Mn-1.5Al alloy might be the best choice. For best weldability, unalloyed titanium or the Ti-5Al-2.5Sn alloy would be most applicable.

No single titanium alloy has the properties a fabricator might want for all applications. The same applies to alloys of steel and of aluminum. The "dream" alloy has yet to be developed. Right now it is essential to use the present commercial alloys to their best advantage.

Heat treatment is a key to obtaining optimum properties in the majority of titanium alloys. A review of how heat treating can be used to good advantage with aluminum and steel helps clarify its application to titanium.

A schematic version of an equilibrium diagram for a heat-treatable aluminum alloy is shown in Fig. 2. In this system, "heat treatability" depends upon the difference in solubility of the precipitating phases at the "solution" temperature and the "aging" temperature. The precipitating phases are intermetallic compounds which may have a complex chemistry.

These alloys are heat treated by quenching very rapidly from the upper range shown in Fig. 2 and then aging at room or slightly higher temperatures. This treatment strengthens and hardens the alloy by producing a fine dispersion of the compound which is coherent with the solid-solution matrix.

Softening or annealing is accomplished either by cooling slowly from the solution temperature or by holding at intermediate temperatures. Either of these softening treatments produces a coarse, agglomerated dispersion of the compound in the aluminum matrix.

Heat treating steel

For steel, heat treatment involves cooling at a selected rate from above a "critical" temperature and perhaps reheating again in a tempering operation. Slow cooling from above the critical produces lamellar structures of sizeable plates of carbide in a ferrite matrix. This structure is relatively soft. Quenching produces martensite, a hard, brittle, supersaturated solid solution of carbon in a strained lattice.

In "tempering," the carbon precipitates and the resultant microstructure consists of a fine dispersion of carbide in ferrite. After tempering

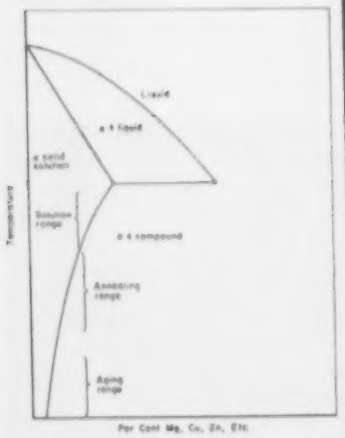


FIG. 2—Representative phase diagram for aluminum and elements forming heat treatable alloys.

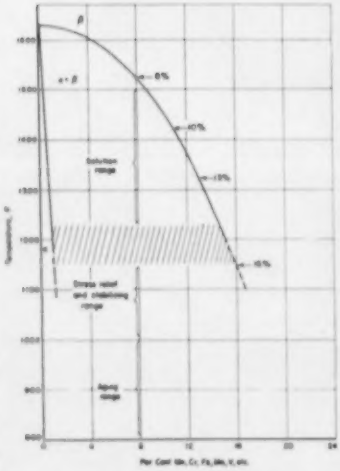
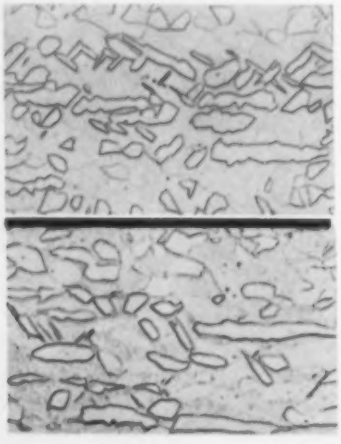


FIG. 3—Phase diagram for beta-stabilizing elements in titanium, showing temperatures used for various heat treating procedures.



Top: FIG. 4—Ti-3Mn-complex alloy, as quenched from solution treatment at 1300°F, showing beta matrix with islands of residual alpha. 500X

Bottom: FIG. 5—Same alloy quenched from 1300°F but aged 24 hrs at 900°F. Beta matrix has been hardened by precipitation of finely dispersed alpha. 500X

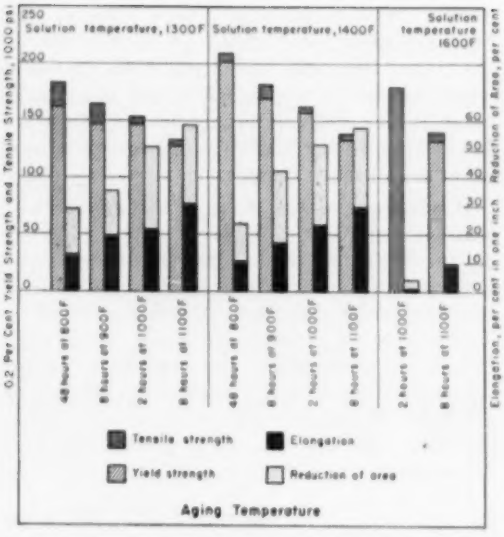


FIG. 6—Tensile properties of solution treated, overaged ½ in. diam bar of the 3Mn-complex alloy, rolled at a temperature of 1450°F.

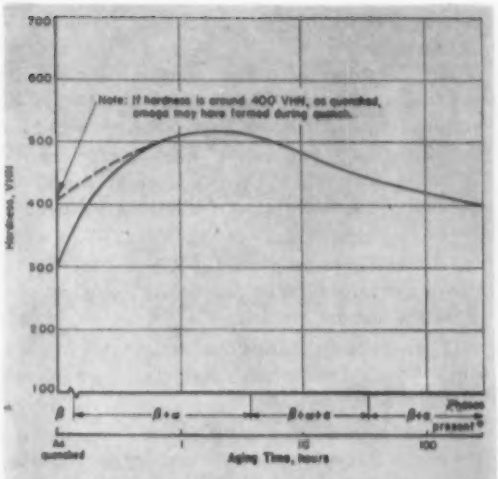

Note: If hardness is around 400 VHN, as quenched, omega may have formed during quench.
Hardness, VHN
Phases present*
As quenched
Aging Time, hours

FIG. 8—Representative hardness curve for alpha-beta alloy quenched from alpha-beta field. *Some primary alpha would also be present unless alloy is quenched from beta field.

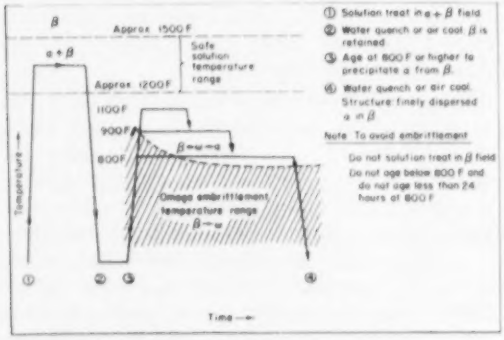


FIG. 7—Recommended heat treating procedure for the alpha-beta titanium alloys.

at higher temperatures, the carbides may grow to coarse spheroids. The strength and hardness are generally controlled by the size and state of dispersion of the carbide phase.

Passing from the more familiar metals, Fig. 3 shows a schematic phase diagram representative of the phase relationships between titanium and the beta-stabilizing elements used in commercial titanium alloys. The transition temperature for unalloyed titanium is about 1625°F. The body-centered-cubic beta phase is stable above this temperature. Below, unalloyed titanium exists as the hexagonal close-packed alpha phase.

When unalloyed titanium and lean alloys containing small amounts of the elements Mn, Cr, Fe, Mo, or V are quenched from the beta field, the transformation occurs as a shear reaction which produces martensite or alpha prime.

This phase is nearly identical to alpha phase. It has the same hexagonal lattice structure but differs slightly in lattice parameter. The product of the martensite reaction in titanium is not strong and brittle as it is in carbon or alloy steels.

To increase the strength of a titanium alloy by heat treatment the alloy must contain enough of one or more elements such as Fe, Gr, Mn, Mo, or V to permit an appreciable amount of beta to be retained during fast cooling. Subsequent partial decomposition of the beta phase at temperatures below 1000°F produces a fine dispersion of alpha. This results in good combinations of strength and ductility.

An alloy containing 8 pct manganese consists of both alpha and beta phases at room temperature as shown in Fig. 3. Heating the alloy above 1250°F causes part of the alpha to dissolve in the beta phase. This treatment is called a solution heat treatment. Quenching causes the beta phase to be retained.

A subsequent aging treatment reprecipitates the alpha from the beta in the forms of a finely dispersed phase. The manganese, which is dissolved in the beta phase, does not precipitate. It has no part in the hardening reaction except to permit the beta phase to be retained during the quench.

Titanium behavior differs

The hardening reaction in titanium alloys is basically a precipitation hardening cycle. It differs from that associated with aluminum alloys in that the alpha phase, which dissolves and reprecipitates, is not a compound. Since the hardening reaction is a nucleation and growth process, it differs from the martensitic hardening reaction which takes place in steel. Titanium behaves somewhat like aluminum and

steel, but its behavior is different from that of either metal.

The commercial alloys containing from 3-9 pct of the beta-stabilizing elements, retain appreciable quantities of beta when quenched or air cooled after solution heat treatment. In order to strengthen a commercial alloy, the following sequence of steps would be used:

(1) Solution treat in the alpha-beta field at temperatures between 1250° and 1450°F. (In alloys containing aluminum, the solution temperature can be higher.)

(2) Quench to retain the beta formed during the solution treatment. Material is relatively soft as quenched.

(3) Age at 800° to 1000°F to precipitate a fine alpha dispersion in retained beta. The alloy is now strong and ductile.

A photomicrograph of the Ti-3Mn-complex alloy quenched from a solution treatment of 1300°F is shown in Fig. 4. At that temperature the alloy was largely beta with islands of residual (primary) alpha. This structure was retained in the quenched condition, and the alloy was soft and ductile.

The microstructure after an aging treatment of 24 hrs at 900°F is shown in Fig. 5. Primary alpha islands originally present are still seen. The beta matrix now contains a fine dispersion of alpha that precipitated from the beta during aging. The resulting microstructure is that desired to produce excellent combinations of high strength and good ductility.

Properties obtainable in the Ti-3Mn-complex alloy, for which these heat treatments were developed, are shown in Fig. 6. Solution treating at 1600°F produced poor ductility because this temperature is in the all-beta field for this alloy.

This sequence of heat treating procedures is simple, but to be applied successfully, the following precautions must be observed:

(1) The aging treatment must not be carried out at temperatures below 800°F.

(2) Aging must be prolonged at any temperature until after the point of maximum hardness.

Heat treated parts may become completely embrittled during the aging process if these procedures are not followed. Embrittlement is caused by a phase, recently discovered, which has been named "omega."* The omega phase is a transition phase with a complex body-centered-cubic structure. Its lattice parameter is about three times as large as that of the body-centered-cubic beta phase.

Omega is believed to nucleate the formation of alpha from beta at temperatures below 1000°F. The omega phase persists for at least 1000 hrs when some alloys are aged at 700°F. To insure complete transition from omega to alpha at 800°F, the aging period must be at least 24 hrs, and preferably 48 hrs. Only 4-8 hrs is required at 900°F, and the time is even shorter at higher temperatures.

A summary of the steps of the quench-and-age heat treating cycle for titanium alloys is shown in Fig. 7. It indicates that the solution temperature must not exceed the beta transus temperature in order to avoid grain coarsening. Aging must be carried out under proper conditions of temperature and time to avoid the "danger zone" of omega embrittlement. Omega may also form during the quench if the quenching rate is not fast enough to prevent the beta phase from transforming.

Stress relief and stabilizing

Any titanium alloy part that develops a hardness over 400 VHN, as quenched or as air cooled from a solution treatment, may contain omega. This is shown in Fig. 8. Fabricators should understand how to prevent this condition, not only during quench-and-age heat treatments, but also after simple annealing and stress-relief treatments.

Stress-relief and stabilizing treatments are as important to the fabricator as solution treating and aging. A stress-relief is usually defined as a heat treatment which produces relaxation of residual stresses due to cold work. Some stress relief is obtained at aging temperatures. More effective stress relief is obtained in short periods of about 1 hr at 1000°-1150°F. At these temperatures there is no danger of precipitating omega from any unstable beta that might be present in the part.

Stress relieving at higher than 1150°F should be avoided. Above this temperature appreciable amounts of beta will form (Fig. 3). If the parts are then allowed to cool in air this beta will be retained. If, at any time in their service life, these parts are exposed to temperatures higher than about 200°F, the beta would partially decompose to omega and the parts might be seriously embrittled.

The cross-hatched area in Fig. 3 is a sort of no-man's land for the titanium fabricator. It is a temperature range too high for stress relief, but not high enough for adequate solution treatment.

A stabilizing anneal produces a stable beta phase. Fig. 3 shows that in the Ti-8Mn alloy, the beta which exists at 1525°F contains only 8 pct manganese. At 1150°F the beta may contain as much as 16 pct of this element. Since the composition of the beta determines its stability, this alloy and others containing Mn, Cr, Mo, V or Fe can be stabilized by holding at 1100-1150°F, or by cooling slowly through the range 1200-1000°F.

*P. D. Frost, W. M. Parris, L. L. Hirsch, J. R. Doig, and C. M. Schwartz: "Isothermal Transformation of Titanium-Manganese Alloys," ASM *Trans.* v. 46, 1954, p. 1056.

Converted Planer Cuts Skin Milling Time

◆ THE GROWING TREND toward skin milling of aircraft parts got a tremendous boost in two recent conversions of 300,000-lb pit type planers to automatic skin millers. Aircraft designers struggling with the strength-weight problem long ago came up with the need for integrally stiffened skin for wing sections. Early experimental models were routed out—a 600-hr job. North American Aviation has now cut the time to 3.3 hr.

To do it they converted a huge (12-ft high, 25-ft wide, 30-ft long) pit planer to a tracer controlled milling machine. Early in June the Simmons Machine Tool Corp. demonstrated a similar machine which it converted, also for North American, from an identical planer. The planers were built in 1943 for work on steel boiler plate, never used. At its Albany, N. Y. plant, Simmons demonstrated the new machine which North American expects to put into operation early in September to mill 16-ft long wing panels two at a time for its F-100 Super Sabre. This is the only operational supersonic fighter in the United States' arsenal. Because suitable planers were available the machine's price tag was about half that of a new unit.

CONVERSION SKIN MILLER handles two 16-ft long wing panels for F-100 Super Sabre. Equipment can generate a carload of chips a day.

Tracers control depth

The unit demonstrated by Simmons is electrically and hydraulically controlled, with a moving gantry carrying two Onsrud milling heads. Depth of longitudinal cuts is controlled by tracers moving over laminated steel guides on the fixed bed parallel to the work. Cross feed is controlled by solenoids which engage pins on a guide bar mounted on the gantry.

Since the ribs the machine generates are not parallel, the panels are held by vacuum to a table which pivots about a point near one end. Hydraulic cylinders move the opposite end. These cylinders get their impulse from the fingers of solenoids on the horizontal control bar.

This control is interesting. Though not electronic, the unit has a "brain" which goes to work at this point to tell the horizontal cylinders in which of six predetermined positions it is in, then signals whether it should move left or right to the next position, where it is again clamped by a vertical hydraulic cylinder.

While the machine now has two heads, it can be fitted with any reasonable number, may be used to mill five leading edges at once. Present heads, cutting 75ST aluminum, are driven by 60-hp motors. Longitudinal cutting speeds are 20 to 120 ipm, return is at the rate of 1000 ipm. Metal can be removed at the rate of 250 cu in. per min. Accuracy is ±0.001 in.

In following the pattern the milling cutters would have a tendency to break or stall the motors when depth of cut is sharply increased. North American has fitted a sensing device ahead of the tracer to overcome this.

Using self-propelled cages—

Horizontal Seams in Gigantic Bins Welded by Submerged Arc

◆ Automatic and semiautomatic submerged arc welding played a major role in the construction of eight gigantic grain storage bins, each measuring 195 ft long, 135 ft wide and 75 ft high . . . The project involved more than 125,000 ft of welding in the field-erected structures.

◆ Horizontal seams were made with automatic equipment mounted on self-propelled cages . . . Two electrodes, one from each side fed in the 3 o'clock position, gave complete penetration in one pass . . . Welding speeds were better than normal for automatic equipment.

By E. H. WEIL, District Engineer, The Lincoln Electric Co., Cleveland

TANK in foreground shows the unusual design employed for the all-welded rafter trusses.

◆ EIGHT huge steel grain storage tanks recently completed in Portland, Oregon, give that city the largest grain handling facilities on the West Coast. They are practically all-welded design, containing more than 125,000 lineal feet of welding. Much of this footage was welded in the field with Lincoln automatic and semiautomatic hidden or submerged-arc equipment.

The gigantic bins have a total storage capacity of over 6 million bushels. They were built by the Northwest Div. of the American Pipe and Construction Co. at a cost of $1,300,000.

The tanks—all identical—are oval shaped with deeply rounded roofs. Each unit is 195 ft long, 135 ft wide and 75 ft high at the center including the conveyor system. Some 3200 tons of steel were used in the project.

The floors were made of 3/16-in. plates, most of them being 7½ by 30 ft in size. These floor plates, set on a concrete retaining rim which supports a sand fill, were lap welded with semiautomatic hidden arc equipment. Predetermined sequences were followed to minimize distortion.

Tank walls were made of five courses of steel plate, the first four being 8 ft high and the fifth varying from zero at the centers to 10 ft at the ends. The first four courses were made of 8 by 25 ft plates. The bottom course is 7/16 in. thick and the top three courses, ¼ in. thick.

INSIDE welding unit joins bottom wall course to floor as truck follows with generators.

Welding of the bottom course to the floor edge and of the succeeding courses to each other was done with fully automatic Lincolnweld heads and controls, one on each side of the tank wall. This equipment was mounted in a specially-built self-propelled cage suspended over the tank wall as each course was erected.

Welding of the horizontal square butt joints was done with the electrodes in the 3 o'clock position on opposite sides of the joint. Full penetration was obtained by making one pass from each side simultaneously. A flux dam held the granular flux around the arc during welding and until the slag had solidified. Speed of welding was well beyond that normally attained by automatic welding.

Trusses all-welded design

Two 900-amp motor generators which supplied welding current were mounted on a two-wheeled rubber-tired buggy and towed around the tank wall just behind the welding cage by a light truck. The flux used was No. 760 and the wire L-60.

The roof of each tank is supported by three prefabricated towers in the center and two steel column-supported rafter trusses, 46 ft long, one on each side of the tank. The three center towers support a bridge truss approximately 110 ft long which in turn supports all the overhead conveyor equipment.

Both the towers and rafter trusses are of all-welded construction. Some bolts were used for erection purposes but each bolt was tack welded to prevent loosening. The towers were anchor bolted to massive concrete footings. All anchor bolts extend through the floor plating, and the tower footing was seal welded to the floor plating for watertightness. The principal structural members in the towers are 6 by 6 by ¾ in. angles.

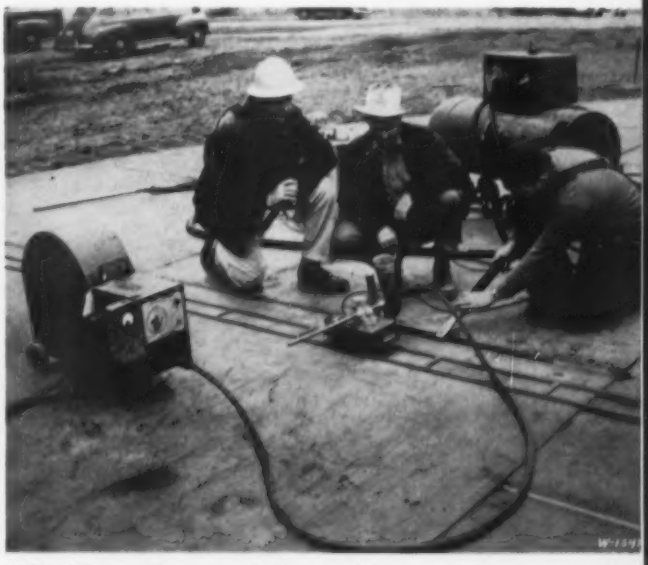
Welded construction was also used on the 10-in "H" beam side supports joining the towers to the tank walls. All base plates, gussets and attaching angles were welded. Some 70 stiffeners on each tank join the rafters to the side supports.

Contact electrodes speed operation

The roof is made of 3/16-in. steel plates which were lapped against the weather and welded on the horizontal joints with 3/16-in. iron powder-type electrodes. Welding speeds with these electrodes were considerably faster than those obtained with the conventional 7/32-in. E-6012 electrodes which were used on all transverse joints.

The conveyor system for the tanks, consists of two 3-ft belts in each row, each capable of dumping 500 tons per hour into the center of the tanks. A shovelveyor distributes the grain inside of the tanks. Another shovelveyor empties the tanks, moving the grain to a drawoff belt which carries it to the main mill conveyor system. The loading and unloading systems, being duplicate, can handle 1000 tons per hour with four belts, each 940 ft long.

Much of the welding on this project had to be done under highly adverse weather conditions. By covering the wall cage with a tarp and drying the plate with a torch before welding, the project was held to schedule.



"SQUIRT" welder, mounted on cutting carriage, welds floor plates in predetermined sequence.

Handling System Puts TV Assembly In High Gear

By R. H. Baddeley,
Industrial Engineer,
Material Handling and Plant Layout,
Sylvania Electric Products, Inc.
Batavia, N. Y.

◆ Handling methods and equipment specially designed for television set assembly enable Sylvania's new TV plant to turn out more than 1400 completed sets per day.

◆ A color coding system used in loading conveyors helps get parts to the right sections on time . . . An unusual storage system reduces inventory requirements, eliminates large banks of parts.

◆ THREE TELEVISION sets a minute—close to 1400 per 8-hour day—are assembled at the new Batavia, N. Y., plant of Sylvania Electric Products, Inc. This production is achieved with the aid of an unusual materials handling system which integrates subassembly, testing, final assembly and storage. Output could be increased to four sets per minute if required.

The plant consists of four continuous assembly lines, each independently supplied, scheduled and operated. Since it was impractical to build and supply 700-ft assembly lines, the lines are subdivided into three operational segments. Segments are linked together by three 3-in. overhead trolley conveyors engineered and installed by Lamson Corp., Syracuse, N. Y. These feed components from one production area to the next at the point where the components are actually needed for production.

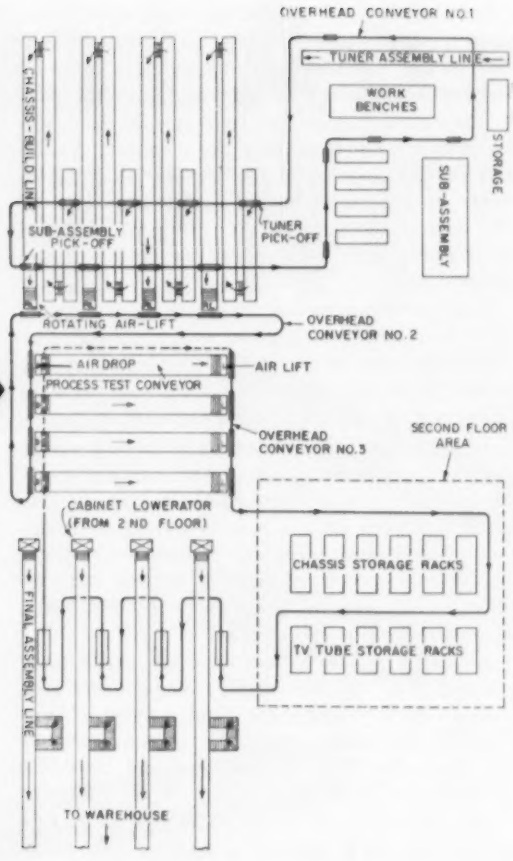
All assembly and storage operations are conveyorized. Production areas receive subassemblies when needed and, as soon as their work is completed, dispatch the assemblies to succeeding work areas. The system is designed to transfer subassemblies between production areas and reduce intermediate storage to a minimum.

Sylvania now makes some six different chassis models, which, with variations in picture tubes and cabinet styles, make up about 60 production models. The conveyor system makes it possible to manufacture four models simultaneously on four independent production lines.

The materials handling setup is laid out to serve the entire plant. A TV set starts life in the tuner assembly and subassembly areas (which assembles yokes, power units and rectifier units). The first of the three overhead con-

"In addition to their handling

beds, come by the transfer point, they descend



LAYOUT OF TV assembly lines and three overhead conveyors linking major production areas.

veyors loops around through the two areas, picking up completed units for distribution to the chassis-build lines in the northeast sector of the building.

The flat-bottom carriers, mounted on the chain at 2-ft centers, have a gross weight capacity of 30 lb each and travel 16 fpm. The 804-ft conveyor dips down at four loading stations in the subassembly area and at two stations in the tuner assembly area, bringing the carrier down to a 4-ft elevation to facilitate loading from subassembly lines.

The main assembly areas — chassis-build, process test, and final assembly—are each subdivided into four independent lines. Since each line usually works on a different model, a color coding system was devised to make certain that components are routed and taken off at the proper place. Line No. 1 is designated by brown, No. 2 by red, No. 3 by orange, and No. 4 by yellow. Each carrier on the overhead conveyors is marked with one of these colors.

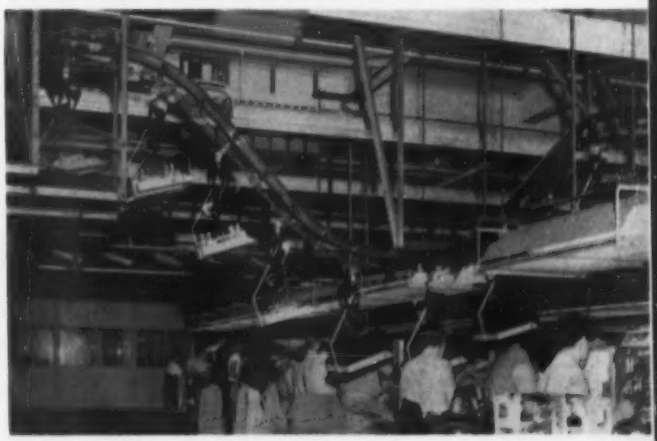
Components destined for a model being assembled on line No. 1 are loaded onto brown carriers. On the receiving end, workers on line No. 1 pick from the conveyors only those components on the brown carriers. The color coding system assures an uninterrupted flow of components to all work areas. After tuners and subassemblies are loaded onto carriers they travel to the chassis-build area, where they are assembled into a fully wired chassis, minus picture tube.

Each line has three conveyors

The chassis-build area consists of four independent lines, each line being composed of three parallel wire belt conveyors moving at 2 fpm. Units start out at the head of the first conveyor line, moving along from worker to worker, until they reach the end of the first line. The semi-completed chassis is then shunted across an 11-ft roller conveyor to the second belt, where additional work is done, and finally across to the third line, where the chassis is completed and given a preliminary inspection.

The first overhead conveyor delivers units from tuner assembly and subassembly areas to the precise points needed on the chassis assembly lines. Tuner assemblies are removed from the carrier by the worker adjacent to the dip in conveyor line, provided the carrier color corresponds to the color for that section. Otherwise the tuners are allowed to proceed to the designated section. The parts coming along from the head of the line are assembled to the tuner, which then moves on to the workers further along the line.

The overhead conveyor dips twice in each



ONE OF EIGHT delivery points in chassis-build section where tuners, subassemblies are received.

"In addition to their handling function, overhead lines are used for banking parts . . ."

production section. At first dip, tuners are removed. At the second dip, yokes, high voltage units, and high voltage covers are removed for assembly on the chassis. Usually two or three units are placed on the same carrier to enable the "take-off" operator to build up a small bank of tuners and subassemblies. The overhead conveyor is operated at about double the speed required to satisfy the chassis-build lines, so that in case the operator lets a carrier go by, another carrier with her color code will be along in a few minutes.

Tight curves in system

Eight dips in the conveyor are composed of 3-ft radius bends, an unusually tight curvature for a 3-in. system. The conveyor is powered by a 1 hp variable speed caterpillar-type drive and is protected by a 90° chain-take-up and Maxitorq clutch to absorb overloads and surges.

When the completed chassis reaches the end of the third leg of the chassis-build conveyor the operator transfers the chassis to a carrier on the second overhead conveyor using a roller bed air lift specially designed by Lamson. As the overhead carriers, which also have roller beds, come by the transfer point, they descend onto a short run of parallel rails, which keep the carrier moving level and prevent sway as the operator pushes the chassis onto the carrier.

ROTATING AIR LIFT transfers chassis to second overhead conveyor. Unit is pedal controlled.

The carriers approach the operator from the front to aid her in making the transfer. As the lift rises, it is rotated 180° so that the chassis rides with tuning controls facing the front of the carrier. This prevents damaging the controls during the loading and unloading of the chassis.

The 492-ft overhead conveyor travels at 20 fpm. Carriers have a gross weight capacity of 122 lb and are mounted at 5-ft centers on the chain. The system is powered by a 1 hp variable speed motor protected by an overload clutch.

In process test the chassis are given a series of detailed performance checks as they move along on a conveyor line. From the process test lines inspected chassis are moved by overhead conveyor to storage on the second floor. Here the chassis are removed from carriers and slid onto storage racks where they remain until needed in production.

Adjacent to the chassis-storage racks is a picture tube storage area. When units are drawn from storage for final assembly, the chassis and matching picture tubes are placed on adjacent carriers on the overhead conveyor for transfer to final assembly.

Both the conveyor system and the color-code system are used at final assembly. Operators on the assembly lines transfer the chassis to benches and the tubes to temporary storage racks. The chassis receive a final test on the benches and are then placed on a length of roller conveyor for assembly in the cabinets. Cabinets arrive from second-floor storage on a reciprocating lift which automatically discharges the cabinets at the head of each assembly line. As the cabinets move along the assembly line, the speaker, picture tube, bezel and other hardware are installed. About midway in the line, the chassis are inserted. The completed sets are packed while on the conveyor and then move directly into the warehouse where they are picked off the line by grab trucks and grouped for shipment.

Use conveyors for storage

Without the overhead conveyors linking the three major assembly areas, about 85 people would be required to hand truck subassemblies from one area to the next. The present force is 38 persons. In addition, large banks of subassemblies would have to be maintained at strategic assembly points, as well as temporary storage facilities at the end of each assembly section. With the overhead lines, little banking and storage is done because these lines serve that function whenever necessary, in addition to their transport function.

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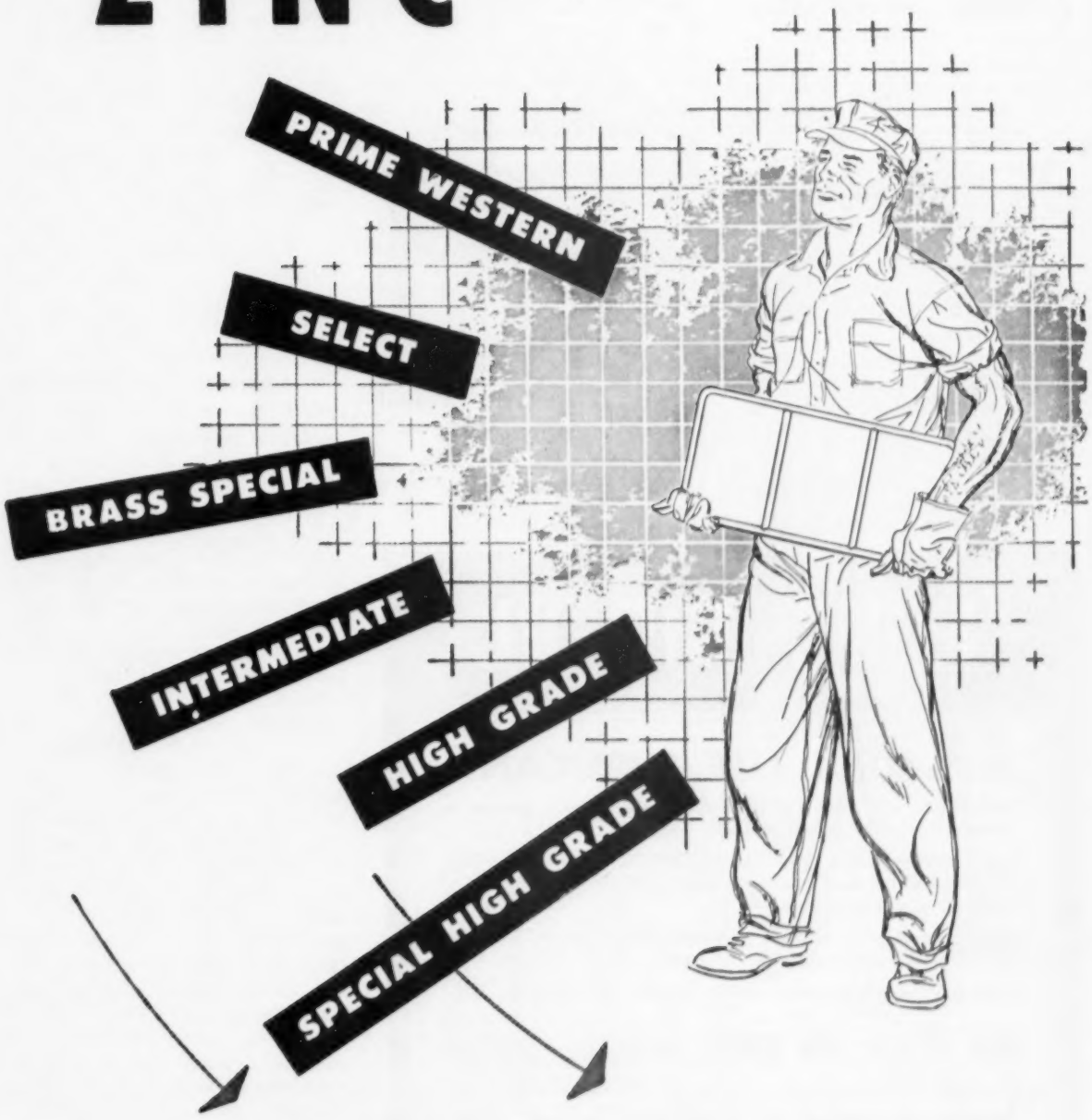

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Airless blast cleaning

The subject of cleaning operations connected with the manufacture of electrical parts is covered in a bulletin. Case histories include: cleaning metal castings for electrical machinery, deflashing compression molded plastic components, and surfacing electrical line and cable fittings prior to such operations as galvanizing. *American Wheelabrator & Equipment Corp.*

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WAREHOUSES: Birmingham, Ala. • Atlanta, Ga. • Columbus, Ga. Charlotte, N. C. • Greensboro, N. C. • Greenville, S. C. • Chicago, Ill. Springfield, Mass. • Detroit, Mich. • St. Louis, Mo. • Providence, R. I.

Also represented in other principal cities

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

Quenching oil

Sun Quenching Oil Light, a high quality low cost quenching oil, is described in a bulletin. Included are a table showing the advantages of various degrees of oil agitation, and a graph showing how it compares with an expensive compounded oil. Topics covered briefly include reducing of drag-out, and uniform quenching properties. Sun Quenching Oil Light can be used in any type of quenching oil system. Cyanide and other heat-treating salts have no effect on this oil, which is a well-refined naphthenic oil with a viscosity of 100 to 115 SUS at 100 F. The bulletin states that this oil has less tendency to form sludges than other oils in its price range, and also has the natural detergency of a naphthenic oil. *Sun Oil Co.*

For free copy circle No. 4 on postcard, p. 81.

FREE TECHNICAL LITERATURE

Roof coating

Permite 3-A (aluminum-asbestos-asphalt) roof coating is the subject of a booklet. It waterproofs, weatherproofs, insulates, and beautifies. It is used for mobile homes, refrigerator trucks, factories, warehouses, commercial buildings and other structures; and can be applied over any commonly used roofing material except wood. *Aluminum Industries, Inc., Permite Paint Div.*

For free copy circle No. 5 on postcard, p. 81.

Clipper oil seal

An illustrated 28-page manual on Clipper oil seal contains information arranged for quick reference. It covers the selection, application and installation of the seals. Documental case histories are included, dealing with petroleum, automotive, mining, earth-moving, aviation, iron and steel, machine tool and process industries. *Johns-Manville*

For free copy circle No. 6 on postcard, p. 81.

Wire gauge

A pocket-size bulletin containing charts for wire gauge and temperature conversion is offered. Designed primarily for wire manufacturers, the bulletin enables the user to convert wire gauge sizes to decimal dimensions of base wire diameter. A temperature conversion table is expressed in centigrade and fahrenheit scales, range OF. to 3772 F. *General Electric Co.*

For free copy circle No. 7 on postcard, p. 81.

Carbide products

The company's product line of carbide tooling, blanks and inserts for the metalworking industry is described. The latest general purpose steel-cutting grade is detailed. Another new product, a grade which provides exceptionally high resistance to abrasion, is described. It is recommended for machining nonferrous metals and chilled cast iron and for compacting ceramics, abrasive wheels and operations where severe abrasive conditions are experienced. *Kennametal, Inc.*

For free copy circle No. 8 on postcard, p. 81.

Steel strapping

A new brochure illustrating U. S. Steel's line of heavy duty flat steel strapping equipment and accessory items has just been published. The brochure contains photographs showing the application of this equipment. Heavy duty flat steel strapping is used for carloading, truckloading, palletizing and unit reinforcement. Brief technical data is included in the brochure. *Gerrard Steel Strapping Div., United States Steel Corp.*

For free copy circle No. 51 on postcard, p. 81.

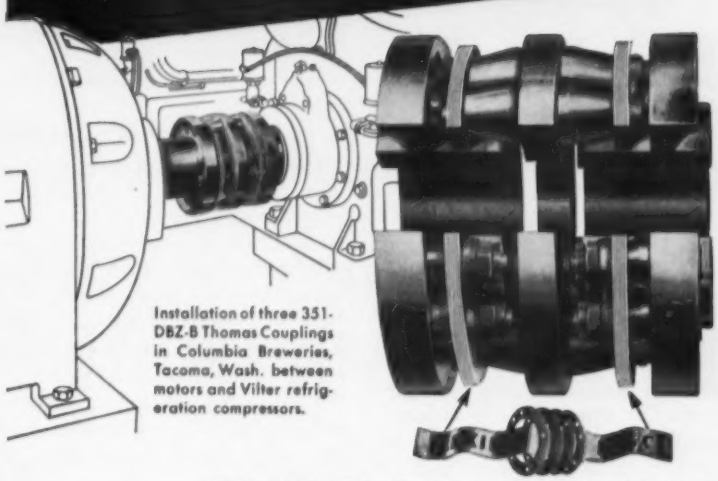
Variomatic

A booklet gives details on the "Variomatic" high production drilling and tapping automatic. It may be equipped with drilling and tapping units grouped around an indexing unit carrying the work holding plate. It is possible to use any combination of up to six working units which can be positioned according to requirements. The units can also be had individually to enable special purpose machines to be built up from existing equipment. *Hahn & Kolb.*

For free copy circle No. 52 on postcard, p. 81.

THOMAS FLEXIBLE COUPLINGS...

for more years of better service!

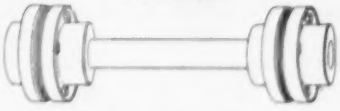


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World

WARREN, PENNSYLVANIA, U.S.A.

Enameling iron

A 32-page booklet deals with the subject of porcelain enamel and enameling iron in a comprehensive manner. To the prospective user it describes and illustrates 16 advantages as a modern, durable, colorful finish. A section on enameling iron covers such points as uniformity, surface, mechanical properties, and gages and sizes. There are sections on design for porcelain enamel parts, fabrication, cleaning and pickling, good enameling practice, testing, and safe crating. *Armco Steel Corp.*

For free copy circle No. 9 on postcard, p. 81.

Sliding head drills

New 16" sliding head box column drills are described. Illustrations include: geared power feed, electrical controls, depth dial, box column and frame, speed change, etc. The many advantages of these drills are given in detail. Specifications are included. *Cincinnati Lathe and Tool Co.*

For free copy circle No. 10 on postcard, p. 81.

Lift trucks

Fast handling of a wide variety and large volume of goods at Cincinnati Transfer Co. is accomplished in 50% less time through the use of five fork lift trucks. These trucks unload, store and load over 100 million lb of merchandise yearly. In the words of Cincinnati Transfer's Carl Vogt: "The secret of success in modern warehousing is efficient materials handling, and fast, dependable service. Towmotor equipment has helped fill these needs for us . . . we have doubled our handling volume and payroll costs have not increased. This has meant a savings of 64 manhours daily since we started using Towmotor fork lift trucks." Details on how these savings were made are available in job study No. 144. *Towmotor Corp.*

For free copy circle No. 11 on postcard, p. 81.

Lubrication pumps

Four bulletins describing lubrication pumps are available. Each refers to a particular series of pumps and gives a description of design features, with diagrams and operating specifications. The oil and grease reservoir assemblies are illustrated; dimensions and capacities are tabulated. *Trabon Engineering Corp.*

For free copy circle No. 12 on postcard, p. 81.

Thread rolling attachments

Containing detailed information on the five sizes of Lanroll attachments available to the trade is a new illustrated bulletin. The attachments can be applied to either automatic screw machines or lathes, and will produce coarse pitch threads to class 4 tolerances. Especially designed for screw machine operations the attachment can be operated at any speed. The attachment can be applied to the cross side of a lathe if a power feed is available. *Landis Machine Co.*

For free copy circle No. 13 on postcard, p. 81.

Air-cooled compressor

The model 20T compressor equipped with the famous Ingersoll-Rand channel valve is described in a bulletin. This air-cooled 20-hp compressor may be either direct-connected or belt-driven. The bulletin includes cutaway views and a table of specifications. This new model brings to the small compressor field the operating efficiency, economy and dependability of the I-R channel valve which has proven its worth in compressors of up to 4000 hp. *Ingersoll-Rand Co.*

For free copy circle No. 14 on postcard, p. 81.

Heat treating

An 8-page booklet entitled "How to avoid heat treating difficulties through correct design of press tools" is available. The material presents a comprehensive study of design factors involved in the reduction or elimination of difficulties arising during the heat treatment of press tools. Topics covered include: proper selection of steel, good design, fundamental design details, sectional dies, etc. *Metal Treating Institute.*

For free copy circle No. 15 on postcard, p. 81.

Fastening problems

Information on how to solve fastening problems is available in a series of data sheets titled "Cold-forming design data," produced by the manufacturers of cold-formed fasteners and special parts. The series will be kept up to date by mailings containing information on new developments, solutions to problems and changing design methods. *Townsend Co.*

For free copy circle No. 16 on postcard, p. 81.

Ore agglomeration

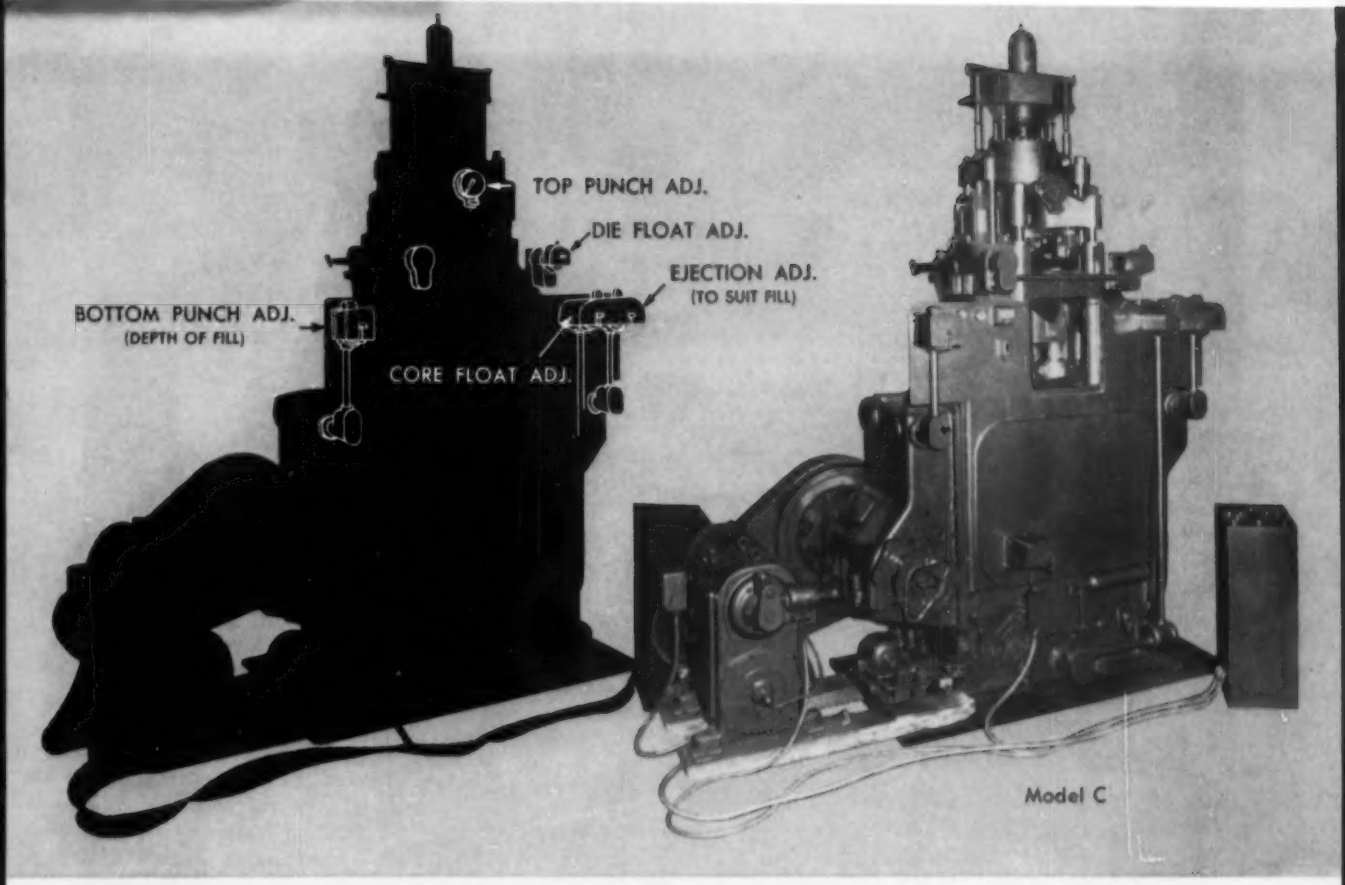
Descriptions, fundamental characteristics of processes and technical information covering the entire field of ore agglomeration is available in a 24-page brochure. Discussed are facts concerning ore agglomeration embracing all of the processes for producing particles of larger size and greater utility from fine ore—sintering, pelletizing, nodulizing, briquetting, extrusion—and variations of these processes for particular requirements. The brochure features charts giving the flow diagram of a sintering plant as well as the mechanical features of the American Ore Reclamation Sintering Machine. *Engineering and Construction Div., Koppers Co., Inc.*

For free copy circle No. 17 on postcard, p. 81.

Amazing crayons

Information on Tempilstiks, the amazing crayons that tell temperatures in preheating, stress relieving, annealing, hardening, casting, plastic postforming, etc. is available. Tempil products provide an inexpensive and accurate way of determining industrial temperatures. Instruction sheets for using Tempilstiks, Tempilaq, and Tempil pellets are included. There are some sixty different Tempilstiks in the range from 113°F to 2000°F, each indicating a specified temperature, within a tolerance of plus or minus 1% of its rating. Tempil products will give good results in induction heating and in ionized air, as well as in the presence of static electricity about electrical equipment, where electrical means of measuring temperatures often function erratically. *Tempil Corp.*

For free copy circle No. 18 on postcard, p. 81.



INDIVIDUALIZED COMPONENTS of new Baldwin powdered metal presses make adjustments easy

It's mighty easy to make adjustments in density or weight in Baldwin's new Model "L" and "C" presses. That's just one of the results of a new concept of compacting powdered metals.

These revolutionary new Baldwin presses are not just remodeled heavy-duty pill presses. They have been designed expressly to meet your end product's needs. For example, instead of having combinations of actions, press components have been individualized. That enables you to make adjustments easily to fit any job.

Since there are no cams to change, many of the adjustments can be made while the presses are in operation. Also all controls are concentrated on one panel for easy supervision and adjustment. Two separate controls adjust the depth of fill and the stroke of the bottom punch. The relative position of the core rod to the die is also adjustable to aid in controlling the fill when making counterbored parts.

Further evidence of Baldwin's new concept includes such unique powder metal press features as . . . hydraulic heads, shuttle type feeders, independently floating die and core rod, automatic lubrication and variable cycling. It's no wonder that initial tests prove that these new Baldwin presses can out-produce competitive models by 200%, turn out compacts to closer tolerances and eliminate costly grinding operations.

You'll find more information and specifications on these new presses in our Bulletins 3101 (C) and 3104 (L). Write Dept. 4816, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pennsylvania.

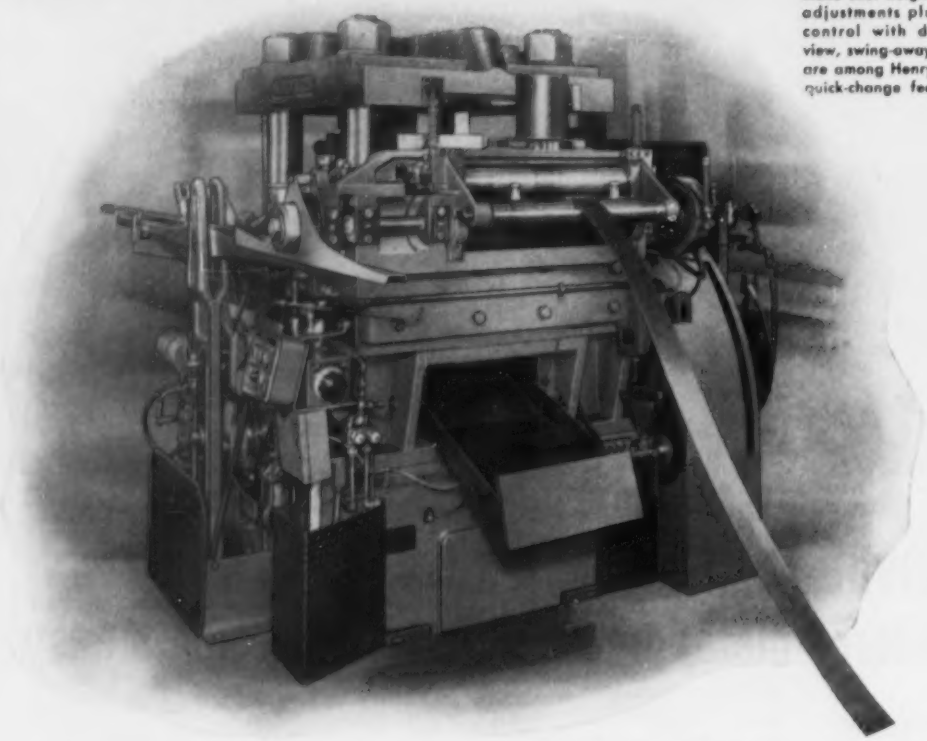
BALDWIN BLH LIMA-HAMILTON

Eddystone Division

BALDWIN-LIMA-HAMILTON

Two to three die changes a day

HENRY & WRIGHTS COMBINE HIGH SPEED OPERATION WITH HIGH SPEED JOB CHANGE



Open construction, easy-to-make shut height and feed adjustments plus inching control with die in full view, swing-away roll feeds are among Henry & Wright quick-change features.

As many as two to three job changes in a day are being made by companies taking advantage of the quick-change features of Henry & Wrights. These companies report sharply reduced costs on short runs. A contract plant said it had greatly improved its competitive cost situation and was re-bidding on jobs previously lost.

Their unique quick-change features are just some of the reasons why Henry & Wrights rate preference in modernization programs. Other advantages are high speed with minimum vibration, precise alignment of punch and die, quick-stop pneumatic clutch, overall rigidity—and the assurance of longer die life.

Only the best is good enough

You owe it to yourself to get the complete story about Henry & Wrights and how they can improve your stamping methods. Our representative will be glad to give you the details.

HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.

521 WINDSOR STREET, HARTFORD, CONNECTICUT

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the post card.

This section starts on page 76

Disc-wheel

Descriptive literature on the new BF reinforced resinoid disc-wheel is available. The disc-wheel is used for portable grinding and cut-off on weldments, metal fabrications and castings. A new bonding process holds every cutting grain exposed, resulting in a sharper bite that removes more metal per wheel, and more metal per minute, than other disc-wheels. It takes only light pressure to start the cutting action. *Bay State Abrasive Products Co.*

Fro free copy circle No. 19 on postcard, p. 81.

Fire extinguisher

This 4-page, 8½ x 11 catalog illustrates Randolph's new line of "power-valve" dry chemical fire extinguishers. It describes 6, 12, 20 and 30 lb models with push-button release, thirty-five foot range, new "highway caution" yellow color scheme. Complete specifications are given. *Randolph Laboratories, Inc.*

For free copy circle No. 20 on postcard, p. 81.

Seals

A loose leaf catalog on Bellofram seals has been issued. These are devices that perform both bellows and diaphragm functions, and at the same time meet the requirements of certain air-operated control mechanisms. The seals are described in detail, and nineteen specific advantages are listed. Basic operation, typical applications, installation information, and standard size tables are included. *Bellofram Corp.*

For free copy circle No. 21 on postcard, p. 81.

Overhead handling

A new 6-page folder describes the flexible overhead handling installation in the Westinghouse jet engine plant, Kansas City. Ten photographs show the Trambeam crane and Monorail equipment in use. Illustrations, captions and text provide many useful materials handling ideas that have application in aircraft, automotive and appliance manufacturing plants, as well as in machine shops, warehouses and foundries. *Whiting Corp.*

For free copy circle No. 22 on postcard, p. 81.

Lathes, milling machines

The entire line of Swedish-built Koping lathes and milling machines is described in a 20-page illustrated catalog. A pictorial description of the factory in Sweden and background information on the 97 year old firm is included in the catalog. *Homestrand, Inc.*

For free copy circle No. 23 on postcard, p. 81.

X-ray unit

The Micro-focus X-ray unit is described in a 12-page catalog. The instrument has wide application in both diffraction and micro-radiography techniques, and features low exposure time, high resolution and provision for utilization of special crystallographic procedures. The text includes a description of the mechanical, electric and electronic assemblies of the instrument. Crystallograms and diffraction patterns for several substances are illustrated. Miniature diffraction cameras available for use with the instrument are described. *Jarrell-Ash Co.*

For free copy circle No. 24 on postcard, p. 81.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 6/30/55

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31	32	33	34	35	36	37	38	39	40
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BUSINESS REPLY CARD
No postage necessary if mailed in the United States

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Village Station
NEW YORK 14, N. Y.

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Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 6/30/55

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Production facilities

To demonstrate its ability to mass produce gears for high-precision applications, as well as regular industrial uses, Foote Bros. has published a booklet that catalogs the production facilities in the company's plants. The 24-page folder lists, in inventory style, the machines used in gear cutting, shaping, hobbing, generating and finishing. Many other machine tools are listed. Manufacturer's name, model and size or capacity are included. *Foote Bros. Gear and Machine Corp.*

For free copy circle No. 25 on postcard, p. 81.

Anchor bushings

The May 1955 Anchor bushing catalog on the subject of laminate plastic tooling includes the latest epoxy resin techniques. Because of superior dimensional stability, epoxy resins are becoming increasingly popular. The catalog offers information on how to use bushings in sheet metal and plastics. *Hi-Shear Rivet Tool Co.*

For free copy circle No. 26 on postcard, p. 81.

Shell cores

A bulletin describes how to produce shell cores for experimental purposes without special equipment and offers technical advice on the blowing of shell cores with shell core blowing equipment. Topics covered include: the design of core boxes, temperatures for blowing, types of sand-resin mixes, blow pressure, core removal techniques, shell core costs, etc. *Shalco Engineering Corp.*

For free copy circle No. 27 on postcard, p. 81.

Vari-Pitch sheaves

Stationary and motion control Vari-Pitch sheaves for speed variations up to 76 pct by means of pitch diameter adjustment, capacities 1 to 600 hp, are described. Where frequent speed changes must be made while the sheaves are moving the motion-control sheave provides positive automatic speed changes at a turn of a hand-wheel. *Allis-Chalmers Manufacturing Co.*

For free copy circle No. 28 on postcard, p. 81.

Steel reference book

An extremely handy stock list and reference book has been issued. This book contains information on practically every type of steel—in stock for immediate shipment. Size and quality extras, combined to save you time in figuring costs, are on the product pages, while base prices and cutting charges are listed in the back of the book. A complete index quickly helps you find the item you want. *Joseph T. Ryerson & Son, Inc.*

For free copy circle No. 29 on postcard, p. 81.

Silicone defoamers

Properties and performance of silicone defoamers are detailed. Special attention is given to Antifoam AF emulsion, said to be the most efficient, versatile and easiest-to-disperse foam killer on the market. Application methods are discussed along with actual working examples in fields ranging from food processing to metalworking. Its parent material, the original Antifoam A Compound, is also described. Antifoam A is a colorless, translucent silicone with a honeylike consistency. It can be dispersed in a variety of solvents, but it is insoluble in water, lower alcohols, glycols and glycerin. *Dow Corning Corp.*

For free copy circle No. 30 on postcard, p. 81.

Profilometer

Profilometer equipment for shop measurement of surface roughness is illustrated and described in a 12-page catalog. Items described include the portable Amplimeter, Tracers for manual and mechanical operation, and motor-driven piloting equipment for straight-line, short-stroke and circular tracing. An introductory section includes a listing and shop shots of the three combinations of equipment most commonly used. Linear pilotors and rotary pilotors are also illustrated and described. The standard Profilometer equipment described covers practically all the widely-varied requirements of industry. *Micrometrical Manufacturing Co.*

For free copy circle No. 31 on postcard, p. 81.

It's a Fact!

. . . Satisfied Craftsmen make better Fasteners at Lamson & Sessions . . .

Yes, you've heard it all before . . . happy, ideal conditions for the workmen, outstanding longevity records, three generations of the same family, etc.

BUT at Lamson & Sessions these things are more than a cause for pride . . . *they are a way of doing business.* From the apprentice machinist to the top echelons, you will find the same spirit of pleasant cooperation.

Because of this fact you, the customer, realize direct, tangible benefits such as better fasteners produced by designers who know their business, workmen who realize the importance of precise workmanship and salaried salesmen whose prime concern is customer service.

When you do business with Lamson & Sessions you just naturally become a satisfied customer of satisfied craftsmen.

We feel that this is the way of doing business that you prefer.

YOU GET MORE WHEN YOU BUY FROM . . .

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THE
Number One Name
In Socket Screws & Keys
ALLEN

Don't take it for granted that any hex socket screw is an Allen. Your Allen Distributor *alone* can offer you

1. **ALLENPOINT SET SCREWS** with the new smaller point — proved by impartial laboratory tests to have greater locking power and vibration resistance, plus uniformly high shaft holding power, compared with conventional cup point screws and those with serrated or angled points.
2. **LEADER POINT CAP SCREWS,** for substantially reduced chance of thread injury or damage to threaded holes.
3. **ALLENOY STEEL** — with the strength and temper to permit the use of smaller sizes, and make button head and flat head screws practical despite necessarily shallower sockets.
4. **ALLEN PROGRESSIVE PRESSUR-FORMING,** producing contoured uncut fiber flow, from head to point. A process originated and perfected by Allen.

Be sure to get Allens in the black and silver striped box, sold only through leading Industrial Distributors. Write us for technical information.

ALLEN
MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

DESIGN: Cut Operating Costs

Redesign of a basic machine tool has permitted reductions in setup time and cut the amount of operator supervision required for the job . . . Machines to closer tolerances.

Push button controls and a number of other unique features on the new Brown & Sharpe No. 00 Automatic screw machine have materially reduced setup time and operator supervision while the job is in progress, according to the makers.

Taking stock up to ½ in., with 1 in. turning length (to 1½ in. with special equipment), and maximum spindle speed of 7200 rpm, it gives increased production on all materials from free-cutting plastics to tough alloy steels.

Parts can be machined to closer tolerances than has been possible on an automatic screw machine heretofore. Because of its rigid construction, carbide tooling can be used to excellent advantage on many jobs.

Positive Chain Drive

Cross-slides and detachable ways of hardened ground steel, precision ball bearings in spindle and sprockets, and fully automatic lubrication reduce maintenance problems to a minimum. The vertical slide is standard equipment, permitting an additional tool position.

Selection of speeds and direction are made by simple pick-off gears. Positive chain drive of the spindle at all speeds assures adequate power throughout the full speed range.

Push-button control of both spindle and driveshaft are provided. A driveshaft "jog" button is particularly useful when setting up. The speed of the driveshaft (either 240 or 120 rpm), which drives all of the automatic mechanisms, is changed by transposing two pick-off gears — all belts are eliminated—and a safety device prevents rotation in the wrong direction. Eleven change gears give the complete range of 120 production rates from ¾ to 100 seconds per piece.

New screw machine . . .

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 81. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Joining:

Compound gives improved electrical joints.

A new compound for sealing electrical joints has been developed by Aluminum Co. of America to serve both as a sealing agent for electrical joints and as a solvent to remove the natural oxide films on aluminum conductor.

As a sealing agent, the new grease-type compound (No. 2 Elec-

trical Joint Compound) is insoluble in water, has a flow point of approximately 150°F, and has no tendency to harden other than natural aging.

Dissolves Thin Oxide Films

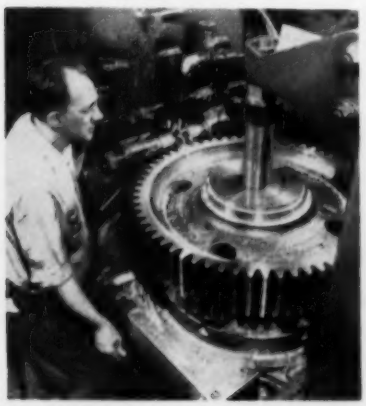
Tests indicate that the film will remain in a joint up to 200°F and maintain stable operation. As a solvent, it dissolves or disperses thin aluminum oxide films without attacking metallic aluminum. It will also prevent the reforming of an oxide film within the range of normal conductor temperatures.

Forging:

Gear blanks exceed material specifications.

Gears cut from die forgings of high grade SAE 1045 steel meet the heavy-duty, long-service requirements specified for driving diesel locomotives, street railway and subway cars, power shovels used in strip mining, large pumps, and other heavy machinery.

Forged gear blanks for 32-in. diam spur gears with 6-in. faces, and for other gears ranging in size from 20 to 40 in. in diameter, are made by the Standard Steel Works Div., Baldwin-Lima-Hamilton Corp. with closer control of analysis and finer grain structure than is required by SAE specifications for this steel. The Nuttall Div., Westinghouse Electric Corp., specifies die forgings of this material for thousands of gears produced for heavy-duty transmission of power.



Cut from forging . . .

need a finish that blocks corrosion by itself—or under paint? specify IRIDITE

You can solve any problem of non-ferrous finishing . . . maximum corrosion protection . . . sparkling clear or colored decorative finishes, firm and lasting base for paint . . . with these two words—"specify Iridite". For example—

- **ON ZINC AND CADMIUM** you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.
- **ON COPPER . . .** Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.
- **ON ALUMINUM** Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.
- **ON MAGNESIUM** Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD

Cladding:

Vinyl clad sheets combine strength, durability, color.

Large sheets of steel and aluminum clad with a colorful skin of abrasion-resistant and rustproof vinyl plastic are coming off the production line at the rate of 4000 sq ft per hour. The sheets, which measure 4 by 8 ft, are produced by the Clad-Rex Steel Co., Denver.

Initially the sheets are being used for wainscoating in hospitals, schools, hotels, office buildings, bathrooms and kitchens. However, they have many other applications including counter topping, kitchen cabinets, truck and trailer body panels, office furniture and chalkboards.

The vinyl is bonded to the metal by the Marvibond process developed by Naugatuck Chemical Div., United States Rubber Co. The process makes it possible to apply vinyl film or sheet of special composition and patterns to sheet metal at a high production rate.

Has All-Around Properties

Coated sheets combine the structural strength of metal with the bright colors and toughness of vinyl. They have higher abrasion resistance than varnish, paint or baked enamel finishes. The vinyl also has high resistance to corrosion. Sheets can be sheared, crimped, bent, drilled and punched with standard tools without separating the vinyl from the metal.

The metal sheets are being coated on virtually a continuous basis with a specially formulated, semirigid film of Marvinol vinyl resin. The sheet metal first passes through a long metal treating machine in which the sheets are chemically cleaned and etched. It then moves along power rollers to the first adhesive-applying machine.

After a thin film of adhesive is put on the sheets, it is allowed to set under infrared heat lamps. The sheets then move along another set of power rollers to a second adhesive coating machine. More adhesive is applied and again set with heat lamps.

The vinyl film is then applied to the metal with a roller, using moderate rolling pressure. The sheets are trimmed individually in a shearing machine.

Clad sheet trims easily . . .

Handling:

Hoist feeds aluminum into giant stretcher.

Feeding heavy aluminum extruded sections into the jaws of a 3-million-pound stretcher, one of the world's largest, and retrieving them after they have been pulled is the job of a Wright two-motor electric hoist at Alcoa's Lafayette, Indiana plant. The extrusions are pulled in the huge stretcher to straighten them and relieve strain.

Equipped with a rope sling, the hoist picks up the aluminum sections from a trestle and moves them into position between the headstock and tailstock of the stretcher. The sling is loosened, but not removed, when the stretcher jaws take hold.

Tremendous Pull Exerted

After stretching, equal to the combined pull of 38 diesel locomotives, the grip of the jaws is released and the hoist retightens the sling. The stretched section is then hoisted to a conveyor where the sling is removed.

Two Wright electric hoists take over when the largest extrusions are stretched. Some of these sections weigh up to 2500 lb and measure up to 110 ft long.

Foundry:

Interest in shell molding continues to grow.

Some 200 of the nation's 5000 foundries are producing shell moldings, and another 500 foundries are experimenting with the process, according to a survey recently quoted by W. S. Thomas, Vice President of Emmaus Foundry and Machine Co., Inc., of Emmaus, Pa.

While the cost picture continues to remain cloudy, shell molding is making rapid technical progress. Based on cost and finish of the molded product, the shell molded castings stand somewhere between conventional casting and the investment casting method.

Differ On Costs

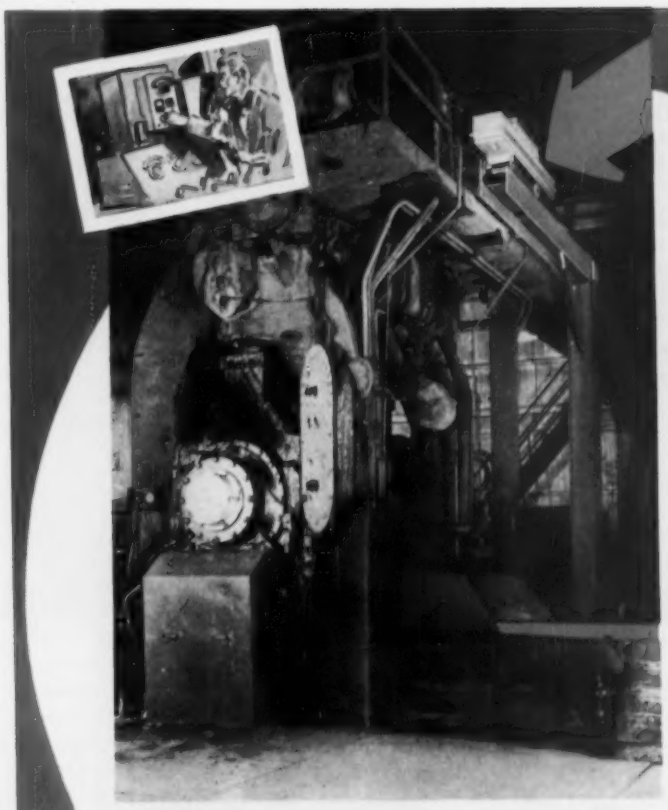
Foundrymen differ regarding the various phases of the cost of producing shell molded castings.

The actual making of shells is the smallest part of the over-all cost. Preparing the shell and pouring are the more costly operations.

Succeeding costs of shake-out, cleaning, grinding are less than in the conventional sand castings, and with proper mechanical handling equipment there are many sand casting jobs being produced today that can be produced through the shell molding process at practically the same cost per pound.

Many casting buyers request tolerances which are both impossible and impractical to secure in shell molding. Although the shell molding process offers many advantages, it has its limitations.

Shell mold casting . . .



Let us show you ...

HOW MODERN NON-CONTACT GAUGES *Cut Mill Costs*

HOT STRIP WIDTH
THE INFRA-RAY WIDTH GAUGE

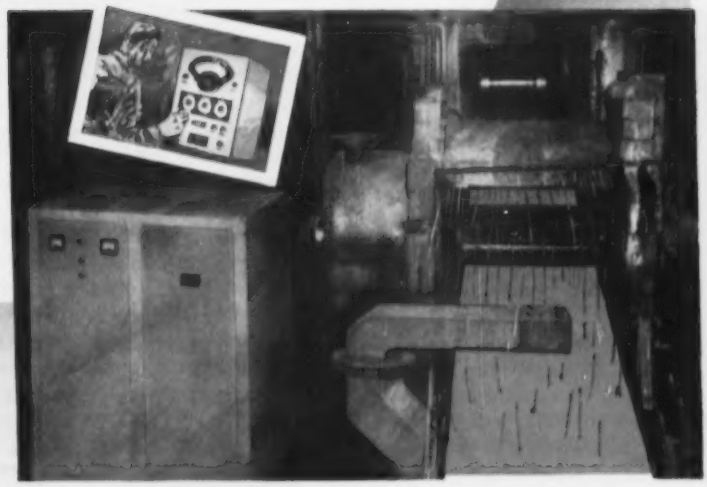
A continuously indicating non-contact gauge operated by radiation from the material being measured—hot strip, plate, skelp, band, bar, shapes, or tubing.

On hot strip finishing stands it is not simply a width indicator. It provides a responsive method of making width by use of *controlled tension.*

This INFRA-RAY Width Gauge reduces trim scrap, avoids hold-back orders to replace a too-narrow coil, and holds mill edge material to closer tolerance.

HOT OR COLD STRIP THICKNESS
THE XactRAY THICKNESS GAUGE

An X-ray operated gauge for non-contact, accurate, continuous indication of strip thickness. A trouble-free, non-mechanical, simply-operated thickness gauge that can be adapted to any size or type of rolling mill and mounted close to the rolls.



THE XactRAYMATIC CONTROL

Electronic equipment for automatic strip thickness control — operated by the signal of the X-ray Gauge. Limits thickness deviation of strip from single stand mills or from the first stand of tandem mills by control of roll screw-down motors. Additional equipment can be provided to control thickness automatically by the same means used manually in the remaining stands, with no change of present mill controls.

This XactRAY Thickness Gauge permits you to accept orders with tolerances impossible to meet by hand control, increase speed of rolling, reduce scrap and returned material.

HOT ROLLED ROD DIAMETER
THE INFRA-RAY DIAMETER GAUGE

For continuous measurement of the diameter of hot rolled wire rod as it emerges from the mill. The infra-red radiation of the rod itself supplies the operating signal to the gauge head which is mounted several feet from the rod.

This INFRA-RED Diameter Gauge will not only measure diameter continuously but will also detect lean rod, over-fill, squashouts, and crossed rolls.

Write for Details

IGC **INDUSTRIAL GAUGES CORPORATION**
ENGLEWOOD, NEW JERSEY

More sand-resin shells will be blown . . . Shells may be stacked . . .

The present investment making of shells may be obsolete in the future, Mr. Thomas believes.

The cold and hot mulled sand process, and the blowing of shells through the use of contour plates will be the final result. This process will not only be faster, but the reduction of the amount of resin used by half to one-third.

Cost of the equipment will be slightly higher, but production cost will be lower. This not only comes from saving in resins, the higher rate of shell production, but principally through the setting up and preparation of the completed shells for pouring.

This would be done also from contour water cooled plates used between each shell with a clamping arrangement, where shells in any number from 10 up to approximately 20 can be set in fixtures and with air operated rams held firmly together without breakage or distortion, eliminating the use of pasting, holding, or the use of shot or slag for baking purposes.

Control:

Rotating reading head gives better tape control.

Close examination of a short section of magnetic tape or wire is now possible with a reading head developed at the National Bureau of Standards to locate and study faults in magnetic recording media.

Developed by J. R. Sorrells of the NBS data processing systems laboratory, this instrument makes use of a reading head mounted on a rapidly rotating drum so that the head is in contact with the tape for a part of each revolution.

Since the tape is held stationary, the head reads exactly the same set of signals once each revolution, and the playback can be displayed continuously on an oscilloscope and observed as long as desired.

In addition to providing a means for closely examining the playback signals from a specific portion of the tape, the reader can be used to scan through and edit a complete tape. The observer can easily locate any defective signals along the entire length of the recorded tape. Interchangeable parts provide a means for examining several different sizes of magnetic tape or wire.

Piercing:

Converted riveter breaks production jam.

An ingenious attempt to break a production bottleneck at Martin Aircraft turned out to produce a method less costly than the one it was to supplement. Facilities for drilling small holes in contoured sheet metal parts that could not be stack-drilled nor pierced on a punch-press were overloaded.

Several surplus rivet squeezers were taken from storage and converted into piercing presses to provide extra capacity. The squeezers were provided with base plates for mounting them vertically on a table, anvils, and pierce punches. They are used with standard drill templates without drill bushings.

Production schedules were met and considerable savings resulted from the higher speed of piercing as compared to drilling. Moreover, burring operations were eliminated.

Riveter does piercing . . .

New Books:

"How to Run A Lathe." The 53rd edition of this popular handbook contains much new and valuable data. Material published for the first time covers use of toolmakers buttons for locating work on the lathe face plate, use of steady rest, follower rest, internal grinding attachment and precision gage blocks. South Bend Lathe Works, South Bend 22, Ind. Paper binding 50¢; leather fabrikoid binding, $1.50. 128 p.

"World Trade Data Booklet." Contains answers to many everyday foreign trade problems. Includes a study of credit terms being granted by U. S. exporters to their customers abroad. Also contains information on mail, telephone, radio and cable message rates and regulations, electric current, conversion factors, international air services, etc. Exporters' Digest, 253 Broadway, New York 7. 50¢. 52 p.

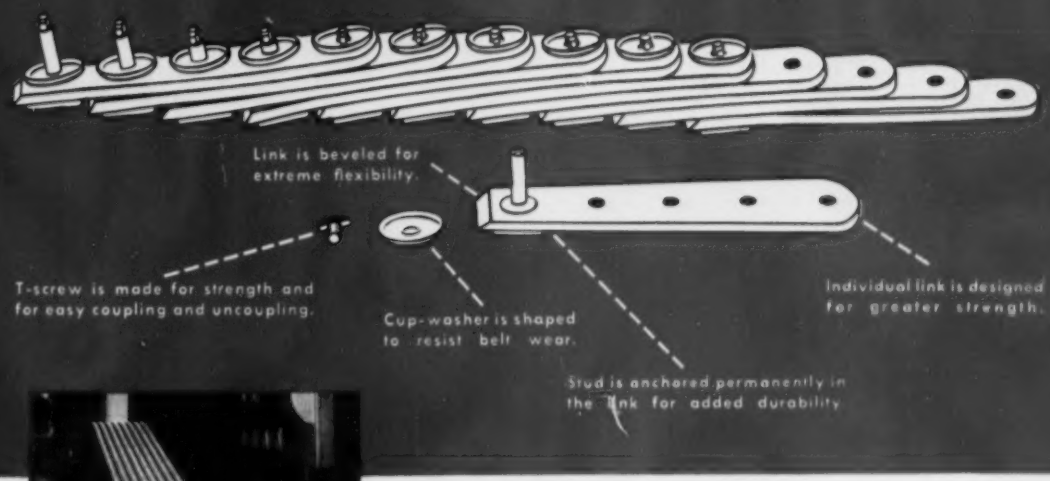
"Fundamentals of Friction and Lubrication in Engineering." American Society of Lubrication Engineers, 84 East Randolph St., Chicago 1. $3.50; $3.00 to members.

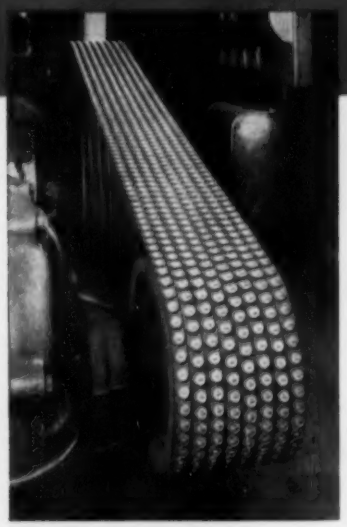
"The Cupola and Its Operation," second edition. Represents the combined thinking of many authorities on foundry cupola operation. American Foundrymen's Society, 616 South Michigan Ave., Chicago. $9.50. 332 p.

"Industrial Engineering Terminology." A handy compendium of 500 industrial engineering terms. Contains precise definitions of many complex production terms. The American Society of Mechanical Engineers, 29 West 39th St., New York 18. $1.50. 50 p.

"Elements of Machine Design," by Emanuel Rosenthal and G. P. Bischof. Simplified theory of machine design, written for students in technical institutes and trade schools. McGraw-Hill Book Co., 330 West 42nd St., New York 36. $4.50. 233 p.

This detailed line drawing of the new, patented Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job . . . easier!


Link is beveled for extreme flexibility.
T-screw is made for strength and for easy coupling and uncoupling.
Cup-washer is shaped to resist belt wear.
Stud is anchored permanently in the link for added durability.
Individual link is designed for greater strength.



New VEELOS

TD and TE Adjustable V-belt

So easy to couple *it installs in minutes*
So strong and durable *it lasts for years*

The new Veelos TD and TE adjustable v-belt is the successful development of a specific v-belt designed for a specific service—D and E drives.

This new Veelos TD and TE v-belt has these basic advantages . . .

It simplifies installation. Links are quickly joined by easy-to-use cup-washers and T-screws to make up individual belts. It's the easiest v-belt to couple and uncouple ever developed. And you don't need to waste time removing outboard bearings.

It lasts longer—is more flexible. New high-tensile strength link combined with new stud, cup-washer, and T-screw gives added durability. New link construction provides maximum flexibility for cooler, wear-resistant running.

Get the complete story of this great new v-belt for D and E drives. Send coupon now for new 8-page illustrated catalog.

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THE LINK
V-BELT

Veelos is known as Veelink outside the United States.

MANHEIM MANUFACTURING & BELTING CO.
653 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.

Name .....

Company .....

Address .....

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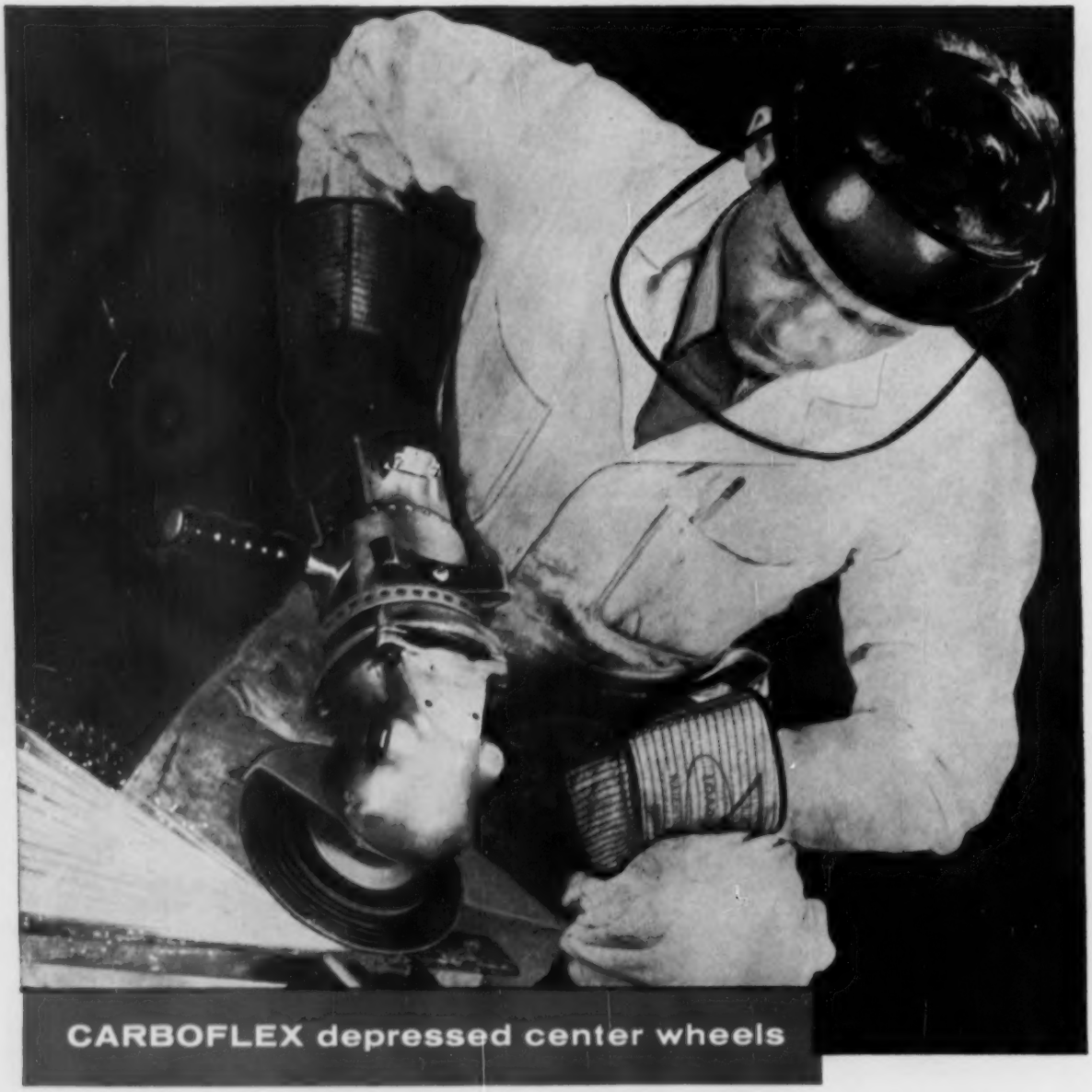
ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Whether you're reducing **HEAVY WELDS**... *or*



CARBOFLEX depressed center wheels

...for faster...safer **ROUGH GRINDING**

CARBOFLEX Depressed Center Wheels will handle your roughest grinding jobs—cleaning castings, roughing off fins and sharp edges, notching and cutting off gates and risers. Each wheel is knurled on the back, as well as the face...lets you cut with either side, plus the edge, without initial dressing. And the resilient, strongly-reinforced bond resists cracking, offers maximum safety.

for **FREE** *booklets* giving complete information on CARBOFLEX and "MX" products, write The Carborundum Company, Dept. IA 81-51, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ontario.

finishing sterling silver **FORK TINES...**

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MX® Fibre-Reinforced Wheels provide a soft, cushion-like cutting action that reduces chatter and vibration...creates a smooth, uniform finish. "MX" cuts clean and resists loading, even on the softer metals and alloys. High tensile strength plus resistance to impact and heat shock means increased operator safety. And "MX" products wear slowly—remain usable right down to the arbor, shank or nut.

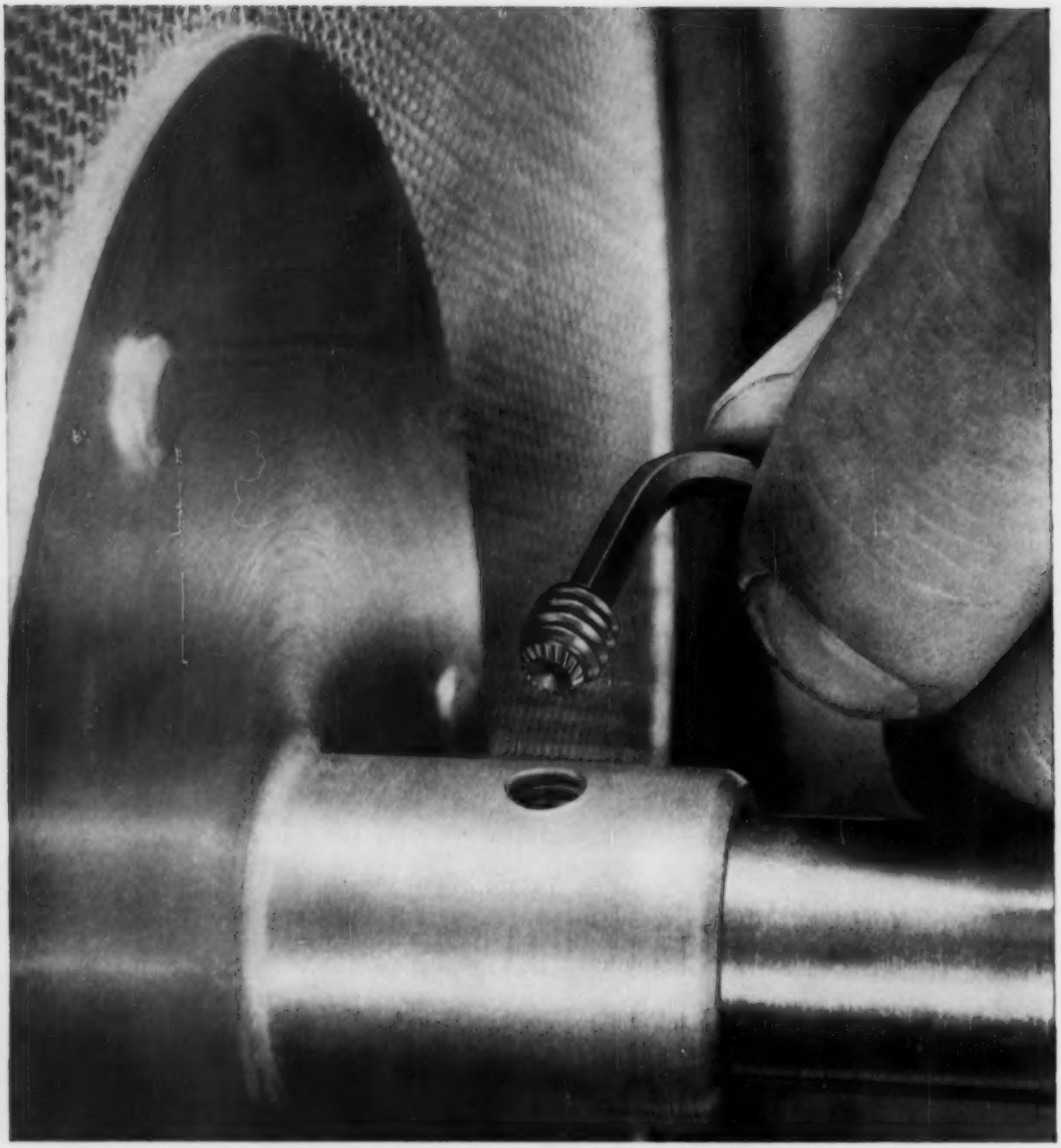
● **YOUR CARBORUNDUM DISTRIBUTOR** or salesman will be glad to demonstrate these cost-cutting products in your shop. Call him today—he's listed in the yellow pages of your phone book under "Grinding Wheels" or "Abrasives."

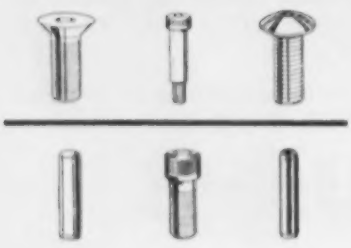
CARBORUNDUM

REGISTERED TRADE MARK

...continually putting more **SENSE** *in your abrasive* **DOLLAR**

UNBRAKO AT WORK





HOW TO KEEP A SET SCREW TIGHT. Tighten it as tight as possible. Keep it in place by preventing it from starting to work loose. With UNBRAKO Self-Locking Socket Set Screws you can do both. They are designed for the highest recommended tightening torques in the industry—as much as 45% higher than those used for ordinary socket set screws. UNBRAKOS have the unique knurled cup point which prevents them from starting to work loose, even in poorly tapped holes. For the complete UNBRAKO story, see your industrial distributor—or write STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

UNBRAKO SOCKET SCREW DIVISION SPS JENKINTOWN, PENNSYLVANIA

...see CHASE'S newest movie!

16mm Sound and Full Color!

24 minutes of exciting information for manufacturers of

- SCREW MACHINE PARTS
- WIRE PRODUCTS
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"IN THE CHIPS" reveals how men and machines work together to give you easier-working, cost-reducing brass and other copper alloy rod and wire.

You see remarkable close-ups of modern screw machine operations—including incredibly fast and accurate turning, deep drilling, reaming and tapping. There are fantastic slow-motion sequences of almost-human machines that transform wire into finished products at lightning speed!

ARRANGE FOR A SHOWING!

Write on company letterhead to the Chase warehouse or sales office near you, or SEND THIS COUPON!

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To: Chase Brass & Copper Co., Incorporated
Waterbury 20, Conn. Dept. IA-655.

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"Saves inspection time" reports Rockford Acromatic Products Company. SURFINDICATOR is used to check finish of automotive, farm implement and appliance screw machine parts.

"Eliminates arbitrary decisions" reports Zenith Radio Corporation, producer of many ordnance parts with specified microfinish. Positive checks of surface finish cut production costs.

SURFINDICATOR is not restricted to metal surfaces. Here instrument is used by Celanese Corporation of America, 24 hours a day, in regular quality control checks of plastic film.

SURFINDICATOR*

This new inspection tool can save you time, cut your costs

Surface finish control is now a simple, on-the-job operation. With the Brush SURFINDICATOR, performance proved in hundreds of plants, you can quickly check surface roughness of any part. You can spot costly overfinishing, speed up inspection, eliminate finishing mistakes. Here is a precision instrument priced within the range of even the small volume shop . . . this instrument completely meets all the requirements of the new American Standard ASA B46.1, 1955 and the Military Standard MIL-Std.-10 for surface finish. For booklet or to request demonstration write Brush Electronics Company, Department S-6A, 3405 Perkins Avenue, Cleveland 14, Ohio.

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INDUSTRIAL AND RESEARCH INSTRUMENTS
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why you should put SUPERFINISH in your blueprints

Longer life, better performance—yes, and *lower costs, too*—should be engineered into the product at the start. For example: when you specify Gisholt SUPERFINISH, you accomplish two things: First, you assure a bearing surface free of the imperfections that cause wear—a surface that will last indefinitely. Second, you cut the cost of grinding—or even eliminate it. Surprisingly enough, you can in most cases achieve this superlative finish at lower over-all cost than is possible with other methods of finishing.

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THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

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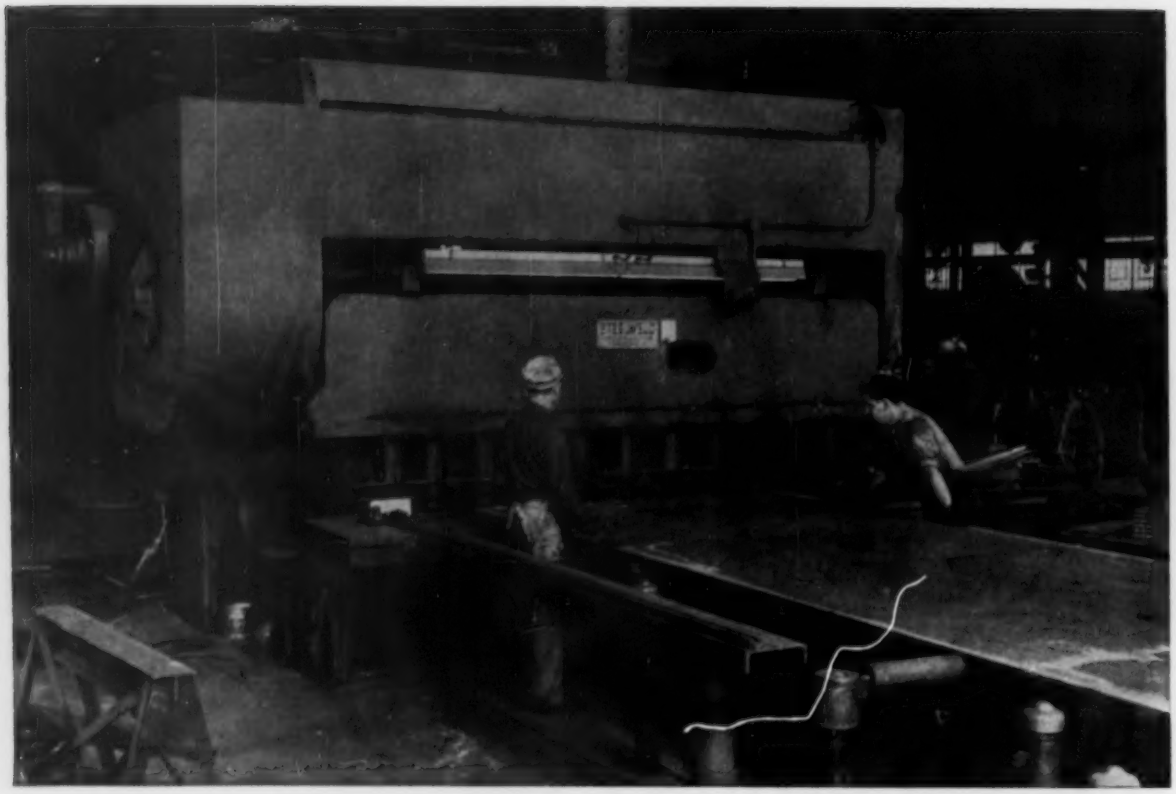
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



Steel plates up to 10' x 1" are quickly cut on this Steelweld. A complete line of machines is available for every thickness from light gauge to 1½" and every length from 6'-0" to 24'-0".

Pivoted-Blade Shears Outstanding for Heavy Plates

WHILE Steelweld Shears are used in hundreds of plants for cutting every gauge of metal, it is on heavy plate where the easy accurate cutting action of the machine is really eye catching. With nothing more than a quick "oomph" the knife goes through the metal quickly and cleanly, seemingly without effort. The resulting cut edges are straight and sharp.

Steelweld Shears are now cutting steel up to 1½ inches thick. A wonderful feature is the ease and speed with which the heavy plate machines can be adjusted to cut the lightest gauge metal. In a matter of seconds the clearance between the knives can be reduced to that known to provide the best result for the thickness of the plate being cut. This is done simply by turning a crank until a gauge indicator is on the correct thickness figure. This feature is known as MICRO-SET knife adjustment and is the talk of the industry.

Production is fast on Steelwelds because they are heavily built to enable high operating speeds. Also, they are equipped with electric foot control. This reduces operator fatigue and often eliminates many steps he must take to the machine.

If you want the most modern machine, with outstanding features that make for the finest in all around performance — tried and proven features, some of which are not obtainable in any other shear — we invite you to get the facts on Steelwelds.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

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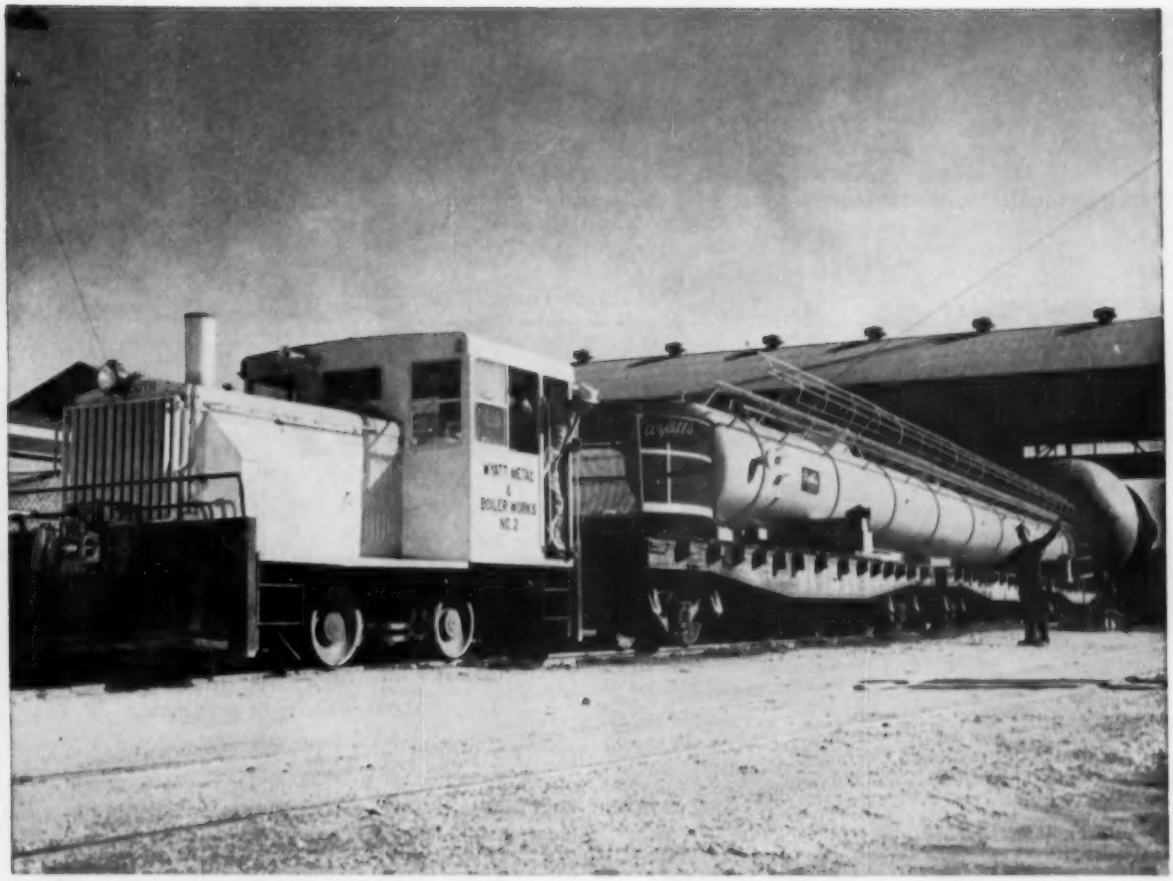
STEELWELD PIVOTED BLADE SHEARS



No down time in 16 months!

That's the record of this 20-ton Plymouth Diesel owned by Wyatt Metal & Boiler Works, Houston, Texas

This modern Plymouth operates approximately 45 hours a week, hauling, switching and spotting railroad cars in the plant. The operator praises the Plymouth Torqomotive* Drive because it eliminates shifting gears under heavy loads, assures smooth, steady power for peak efficiency, and reduces rough starts and coupling shocks.

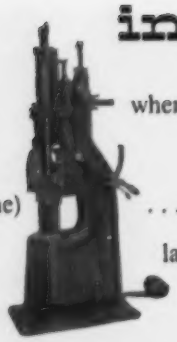
"There just isn't anything we have found wrong with our Plymouth," says E. C. Jones, Vice President of Wyatt. "Efficiency in switching has doubled, and we have lost no time due to repairs or maintenance since we purchased the locomotive 16 months ago. It is far above anything we have had experience with."

If you are not enjoying the benefits of "Industry's Smoothest Switchers" write for illustrated catalog of the Plymouth line—models from 3 to 70 ton. Gasoline or Diesel, Mechanical or Torqomotive Drive. Also Diesel-Electric. PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Dept. A-2, Plymouth, Ohio.

** TORQOMOTIVE DRIVE: PLYMOUTH TRANSMISSION COUPLED TO A HYDRAULIC TORQUE CONVERTER*

PLYMOUTH® TORQOMOTIVES

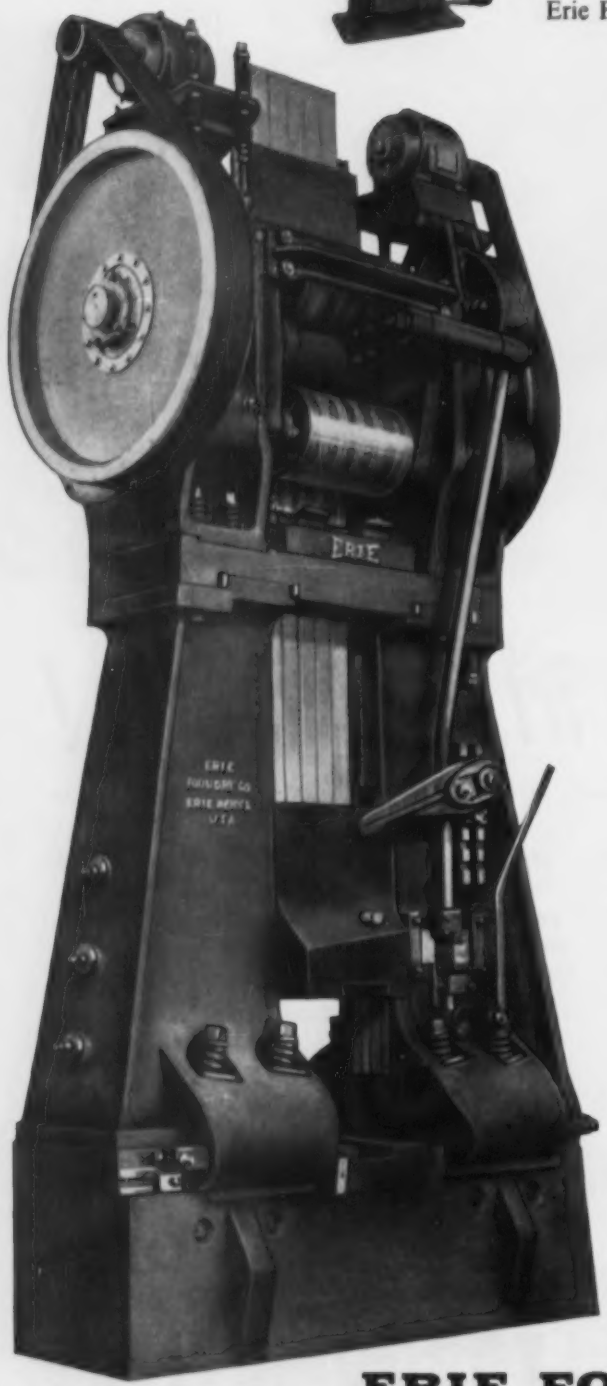
in the good old days



(such as this 100 lb. single frame)

when Erie Foundry was *the first* to use all-steel construction in all our hammers

. . . . . and when hammermen thought a board drop hammer larger than 5,000 lbs. was a wild dream . . . . even then Erie Foundry was a great name in forging hammers



today

Erie Foundry has recently built the world's largest board drop hammer. This 10,000 lb. hammer is at work for Eaton Manufacturing Co's Marion, Ohio forge plant. Eaton is forging 68 lb. net, Flat Back Ring Gears, 16" in diameter, in a single impression die, straight down without blocking or pancaking.

In addition to forging large gears speedily, Eaton likes the Erie 10,000 lb. Board Drop Hammer because the 4-roll lifting head gives longer board life. Air operated board clamps ease the hammerman's job.

As in the good old days, this 10,000 lb. board drop hammer is all-steel . . . and made by Erie.

in our 60th year

ERIE

The Greatest Name in Forging Hammers

ERIE FOUNDRY CO. ERIE, PA.

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 81 or 82

Heats 10,000 lb of steel billets, 16 ft long

Mammoth electric steel forging furnace designed and built for Air Force heavy press program will be used to heat steel billets in controlled atmosphere for 50,000-ton forging press being installed at Wyman-Gordon Co., Grafton, Mass. The heating chamber will accommodate 10,000 lb of steel billets up to 16 ft long at one time, bringing them to temperature of 2400°F. It is provided with certain-curtain atmosphere control throughout the heating chamber to conform to user's requirements that billets must reach the press scale-free in order to assure maximum die efficiency as well as optimum working qualities of the steel. Operation is controlled by eight control panels with 90 selective switches controlling the heating elements. *C. I. Hayes, Inc.*

For more data circle No. 32 on postcard, p. 81.

Has working capacity of 14 ft wide x 7 in. thick

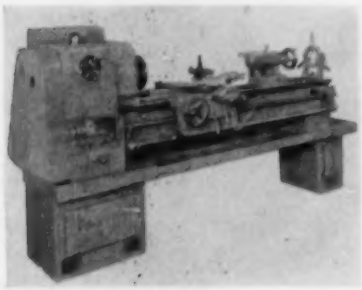
The entire saddle assembly including the operator's station on this new 14-ft stroke hydraulic plate edge planer moves back and forth while the cylinder rods remain stationary with the bed columns. Saddle reciprocates from 10 to 200 fpm and cutting speeds are infinitely adjustable. On right and left hand side head rails are mounted the two side heads that carry the cutting tools. Conventional type planer tools are suitable. Operator controls most saddle movements and all head movements from pendant on platform. *Rockford Machine Tool Co.*

For more data circle No. 33 on postcard, p. 81.

Speed reducers cover wide horsepower range

Capacities of new Line-O-Power speed reducers range from fractional hp to 150 hp. Simplicity and compactness of design and exceptional durability of all components are two important basic features. Duti-rated lifetime gears provide higher capacities in a compact unit. Input and output shafts are in a direct line to permit coupling of motor and speed reducer in less space. Spline drive pinion makes it easy for the user to change reduction ratios. Range of nominal ratios for double, triple and quadruple reductions is provided. *Foote Bros. Gear & Machine Corp.*

For more data circle No. 34 on postcard, p. 81.

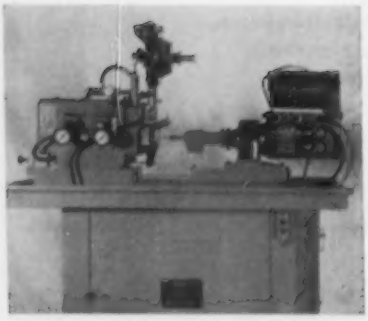


For manufacturing, maintenance and toolroom use

Twelve spindle speeds in geometric progression, with a 3-lever, color-match, direct-reading shift mechanism feature the new, all-geared head Model LE Tray-Top engine lathes. The spindle, with long taper key drive nose, is rigidly mounted in three precision antifriction bearings. Forty-eight thread and feed changes are made available through a totally enclosed, automatically lubricated quick change gear box. Longitudinal and cross feeds are engaged with drop levers operating positive jaw clutches. The machine is built in 10, 12½, 15 and 18-in. sizes. *Cincinnati Lath & Tool Co.*

For more data circle No. 35 on postcard, p. 81.

Turn Page



Locates and holds rivets for axial tapping

Automatic drilling or tapping machine accurately locates and securely holds rivets or other headed parts for axial tapping, or drilling to very thin walls, without out-of-round distortion and central with the axis of the parts. Automatically self-reversing tapping attachments are used for tapping. Changeover from drilling to tapping is easily accomplished in about 10 min. Coolant tanks containing different coolants are exchanged in less than 2 min. Production in mild steel with No. 30 drill 9/32 in. deep is 40 per min. Machine operates by electrically controlled compressed air on at least 50 psi air line pressure at 500 strokes per cu ft of free air. *Batchelder Engineering Co., Inc.*

For more data circle No. 36 on postcard, p. 81.

For finish boring valve lifter bodies

Style 112-D precision boring machine equipped for finish boring valve lifter bodies at the gross production rate of 1200 pieces per hr is a single-end hydraulically operated model with a new hydraulic control panel. Work handling equipment receives parts from a conveyor, directs them into loading chutes, inserts them into chucks and ejects finished parts to another conveyor. Workpieces are cast iron, and the operation is finish boring blind holes 9/16 in. diam and 1 in. deep. Four precision boring spindles carry the tools for completing four parts during each machine cycle. If one of the parts comes to the machine with the hole at the wrong end the machine stops. Also, an interruption in the flow of parts causes the machine to stop. *Ex-Cell-O Corp.*

For more data circle No. 37 on postcard, p. 81.

Punch shaper machines blanking punches in one setup

Economy, versatility, and accuracy are claimed for a new Essex 32A punch shaper. Function of the new shaper is to machine a blanking punch, hob, or profiled part directly from the solid in a single operation, using simple tools and operated by one man. Necessity for making special punch holders or plates is completely eliminated. In the majority of cases, punches can be completely finished in approximately half the time consumed by older, more complicated methods. This machine is set up very simply and a high degree of accuracy and fine surface micro-finish can be obtained, and controlled through microscopic readings. The cutting tool used is the ordinary shaping tool. *British Industries Corp.*

For more data circle No. 38 on postcard, p. 81.

Deburrs and chamfers internal gears and splines

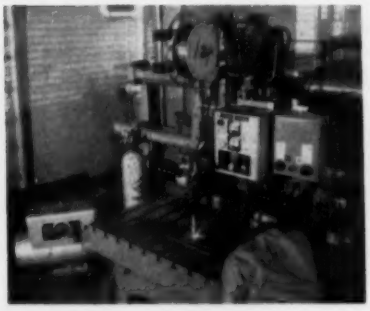
New universal Burr-Master deburrs and chamfers internal splines, straight-sided or involute-form helical and spur gears, ranging in size from 2 to 20-in. pitch diameter with a maximum of 4 diametral pitch. Throat clearance permits handling of parts up to 22 in. OD. For high production of internal gears or splines the machine can be supplied with automation. The BMI-15 is built to JIC standards. A spline driver is used for gears up to 6-in. pitch diameter with a drive gear being used for larger sizes. Both sides of the tooth and the root are chamfered at one time, and the complete chamfering job is completed at the rate of 5 teeth per sec. With adaptations in the tooling, the machine can be used to deburr and chamfer certain types of external gears. An infinitely variable depth of cutting stroke assures maximum operating efficiency. *Modern Industrial Engineering Co.*

For more data circle No. 39 on postcard, p. 81.

Detwister straightens large aluminum-alloy sections

Large aluminum alloy extrusions, warped and twisted by heat treating, can be re-straightened by a new heavy-duty detwisting machine. With maximum torque of 3,000,000 in.-lb at 2½ rpm, the machine aligns irregular sections which can be contained within a 24 in. diam circle, in lengths up to 85 ft. Workpiece is lowered from the top into position between head stock and tail stock, clamped in place by T-slotted jaw carriers. Distance between heads can be varied from 3 to 20 ft. Head stock rotation is infinitely variable from 0 to 3 rpm. A scale, mounted on head, indicates degree of twist applied. *Sutton Engineering Co.*

For more data circle No. 40 on postcard, p. 81.



Uses low-cost carbon dioxide shielding gas

Complete new automatic, consumable-electrode welding equipment is adapted for use with low-cost carbon dioxide shielding gas. The equipment offers a practical method of using gas-shielded welding for mild steel applications at costs which, it is stated, may be the same or below costs of the submerged-arc process. In gas-shielded welding, a consumable-wire electrode is fed to the arc and no flux is used; the operator can see the arc clearly. This visible-arc feature allows savings through use of simple fixtures, 50 pct faster operation on certain applications through reduction of setup time. *General Electric Co.*

For more data circle No. 41 on postcard, p. 81.

Makes two hairpin bends simultaneously

In a cycle time of less than 3 sec, two 180° hairpin bends in ferrous or nonferrous finned or plain tubing can be formed simultaneously on this low-cost, tube bending machine. Insertion of the tubing into the machine initiates an automatic bending cycle in which the tubing is bent and ejected after bending. The machine will bend light-wall tubing on small radii without flattening or lengthening, and without the use of ball mandrels. Tubing is bent by radial movement of the hydraulic actuator controlled bending table. Pushbutton controls are provided for setup operations. Machine has single-tube capacity of up to 1 in. diam. *Walter P. Hill, Inc.*

For more data circle No. 42 on postcard, p. 81.

Machine broaches end of an automotive rear axle

This broaching and centering machine broaches the end of an automotive rear axle to length and then centers the broached surface. The machine is arranged with four 2-station fixtures equally spaced on an indexing trunnion which operates on an eight index arrangement. Two parts are unloaded and loaded by the operator at the front of the machine as the parts rotate past. In simultaneous operation, two parts are surface broached at the back station while two parts are center-drilled at the top station. The operator pushes buttons after loading to start cycle. Tooling includes the fixtures which hold two parts each and locate and clamp with equalizing jaws at both ends. Indexing mechanism is Geneva type. The centering unit consists of two 2-spindle American units mounted on top of the trunnion support on either side of the fixture, and electrically interlocked to the cycle. Parts are broached by surface broaches. Broach and holder assembly is mounted on the vertical machine slide. *American Broach & Machine Co.*

For more data circle No. 43 on postcard, p. 81.

ROD MILLS

ROUGHING MILLS

around the world...

MERCHANT MILLS

BLOOMING MILLS

STRIP MILLS

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MM 43-55

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

The Iron Age SUMMARY . . .

Steel wage negotiations boil to crisis this week . . . Higher wages and prices in the offing . . . Freight car program confounds delivery problem

Wages and Prices Rising . . . Steel labor gets its pay raise this week. It will be less "substantial" than union leaders had hoped for but more than steel producers wanted to give. Steel consumers will begin paying higher prices soon.

Before the settlement is reached, frayed nerves will be evident. Both sides, with a lot at stake, have been laying it on the line in the home stretch. Differences could erupt into something more serious than table-pounding if one major producer holds firm on its late offer of 12½¢ an hour.

No Strike Likely . . . But even though the negotiations should drag on to the Thursday night strike deadline, a peaceful settlement is likely. At press time it looked like the union would get a total of between 13 and 15¢ per hour, with about 3.5¢ allocated to cover increases in the wage differentials between job classes.

Steel prices will be upped an average of $4.50 per ton, with products being increased from $4 to $6, perhaps more than $6 on some items. Increased wage costs and the need for more money to finance another round of expansion require a realistic hike in prices. But not enough to avoid some absorption by steel firms. This absorption may be offset later by increased productivity through more efficient equipment and production techniques.

More Trouble . . . Steel companies will step from the frying pan into the fire once they dispose of steel labor. The ominous silence from the camp of John L. Lewis has them worried about their coal mine costs. If history repeats itself, "The Old Man" will be springing his trap soon. He can reopen his contracts on 60 days' notice. He's been waiting for the comeback that coal and steel made this year. And he'll want to do better than such youngsters as Walter Reuther and Dave McDonald.

Meanwhile, the railroads have lowered the boom on hopes of bringing steel deliveries into line with promises. They've hit the mills with a new freight car program of 45,000 units. Some 1.2 million tons of finished steel and castings will be required. Here is the breakdown:

The Details . . . Castings, 225,000 tons; wheels and axles, 180,000 tons; structural shapes, 270,000 tons; bars, 45,000 tons; plates, 315,000 tons, and sheets, 135,000 tons. A big "crash" repair program will require heavy additional tonnages.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week† 2,328	Last Week 2,304	Month Ago 2,330	Year Ago 1,680
Ingot Index (1947—49=100)	144.8	143.3*	145.0	104.6
Operating Rates				
Chicago	97.5	97.5*	100.0	82.5
Pittsburgh	100.0	99.0*	97.0	69.0
Philadelphia	98.4	97.5*	96.2	60.0
Valley	98.0	97.0*	96.0	67.0
West	97.0	96.8	102.0	76.0
Detroit	92.0	97.0	92.0	84.0
Buffalo	105.0	105.0	105.0	67.5
Cleveland	101.6	101.7*	104.0	67.0
Birmingham	93.5	92.5*	96.0	76.0
S. Ohio River	82.1	76.2*	83.0	82.5
Wheeling	97.0	102.0*	95.0	90.0
St. Louis	106.1	106.4	106.0	34.5
Northeast	89.0	89.0	90.0	58.5
Aggregate	96.5	95.5*	96.5	70.5

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron, (Gross ton)	$56.59	$56.59	$56.59	$56.59
Scrap, No. 1 hvy (gross ton)	$36.50	$35.33	$34.00	$26.92
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	21.50
Copper, electrolytic	36.00	36.00	36.00	30.00
Lead, St. Louis	14.80	14.80	14.80	13.80
Magnesium, ingot	29.25	29.25	29.25	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	95.00	94.50	91.50	96.50
Zinc, E. St. Louis	12.50	12.50	12.00	11.00

Railroads Will Tighten Markets

New freight car building programs will up demand for plate, shapes, bars . . . Warehouses can offer no big assist to purchasing agents . . . All products remain tight.

◆ NOW THAT the railroads have jumped into the steel market with both feet, purchasing agents will have to scramble harder than ever to round up their requirements.

Railroad buying will affect plates, shapes, bars, hot-rolled sheets, forgings and castings.

Most of these products have been tight for months.

Agents casting an apprehensive eye at the warehouses can expect to find no solace. There's a mounting chorus from all districts that warehouse business of late "looks like old times." Every product is tight and getting tighter.

Inquiries, in some cases, are for larger tonnages than the warehouses can handle. In one district, certain tonnage orders have been so large—actually mill tonnages—that warehouses couldn't handle them in a slow market, let alone now.

Automakers' model changeovers won't lessen the current order tempo. Some auto producers are still down to five days' inventory with no appreciable letup in product demand at the mill level in sight.

A newly-announced linepipe construction and reconversion project in the Southwest can be expected to take a good chunk of plate—already in tight supply. Total cost of the project will run to $86.6 million, is slated for completion by the fall of next year.

Break-down of a large producer's rod mill—expected to be out of operation about two weeks—will reduce rod output by an estimated 4000 to 5000 tons.

SHEETS AND STRIPS . . . Pressure for deliveries and new orders has picked up by leaps and bounds in **Detroit**. Automakers have stepped up their cries for more. Some **Chicago** sources look for sheet carryovers to extend all the way through fourth quarter. So far, no one has been told that mills will drop more than 30 days in their effort to lick the carryover situation. Mills are standing pat to see what will happen after automotive model changeovers begin. From **Pittsburgh** comes word that average sheet deliveries are out to 7 or 8 weeks, while in the East, third quarter is filled for all practical purposes.

BARS . . . One major **eastern** producer reports there's still some carbon bar available for September, while another has closed the order books on all sizes and grades of bars for third quarter. On the **West Coast**, mills are sold out well into September. Automakers top the consumer list, with strong increases reported in agricultural demand. Carbon bar business in **Detroit** has had a sharp pickup. Automotive leads the parade. One producer who had opened fourth quarter order books has now closed them temporarily to see how well production can be arranged. Demand for bars in **Pittsburgh** continues steady with deliveries causing no serious concern to consumers.

STRUCTURALS AND SHAPES. . . Wide-flange, I-beams, and standards are being produced at 100 pct capacity in **Pittsburgh**. Demand, however, still outstrips production. Delivery dates are extended and monthly carryovers increased. With a new round of heavy industrial construction getting underway in **Chicago**, a tightening third quarter structural market is looked for. Major **eastern** producers report that heavy area building programs have all but closed out third quarter for the major grades and sizes of structurals. **West Coast** mills report a pickup in structural sales tempo with bookings now extending into early September.

PLATES . . . Availability situation in **Pittsburgh** is really tight. Actually, mills are already using every available facility to meet demand and still can stay nowhere near even in the supply-demand picture. Consumer situation looks black as inventories near rock bottom. In **Detroit**, warehouses report that business is at a peak level for plate. It's currently reported that mills are allocating plate and this is causing a tight squeeze. Plate picture in **Chicago** is no better than in **Detroit**. There's a strong likelihood that plate will continue to tighten through third quarter. In the **East**, there is still some plate available for September.

PIPE AND TUBING . . . Oil country seamless orders are now well into fourth quarter in **Pittsburgh**. Welded pipe is solid at the moment through August. In the **East**, oil country goods are through third quarter with buttweld deliveries into August. On the average, deliveries for most sizes and grades of pipe are running out to 6-8 weeks.

WIRE PRODUCTS . . . **Cleveland** reports that merchant wire deliveries are out about 7 weeks with manufacturers wire running to about 14 weeks. In **Detroit**, there's no letup in sight for manufacturers wire. Merchant wire business right now is reported holding its own. Production of merchant wire in **Pittsburgh** is expected to remain full through July, with some fall off expected thereafter until October. In the **East**, one producer reports demand for rods is heavy—might get heavier. Rod delivery is at around 5-6 weeks at the moment. Some pickup in consumer demand for nails is reported.

WAREHOUSE . . . West Coast warehouses report that supplies are getting very tight on **eastern**-produced structural sections and such **western** mill products as plate, sheet, cold-finished bars and stainless strip. Warehousemen say the peak hasn't yet been reached.

Purchasing Agent's Checklist:

STEEL: Higher prices will pay for wage boost . . . . . p. 19

RAILROADS: Rush new freight car orders . . . . . p. 22

PLASTICS: Making serious bid for truck, trailer market . . . . . p. 26

MACHINE TOOLS: Sales hit 21-month high . . . . . p. 47

Comparison of Prices

(Effective June 28, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 28 1955	June 21 1955	May 31 1955	June 29 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.225	4.225	4.225	4.10
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. terns	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.22
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Rails: (per 100 lb.)				
Heavy rails	$4.45	$4.45	$4.45	$4.325
Light rails	5.35	5.35	5.35	5.20
Semifinished Steel: (per net ton)				
Rerolling billets	$64.00	$64.00	$64.00	$62.00
Slabs, rerolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.797¢	4.797¢	4.797¢	4.634¢

	June 28 1955	June 21 1955	May 31 1955	June 29 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$61.19
Foundry, Valley	56.50	56.50	56.50	56.50
Foundry, Southern, Cin'ti	60.43	60.43	60.43	60.43
Foundry, Birmingham	52.88	52.88	52.88	52.88
Foundry, Chicago	56.50	56.50	56.50	56.50
Basic, del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Malleable, Chicago	56.50	56.50	56.50	56.50
Malleable, Valley	56.50	56.50	56.50	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢
‡ 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$36.50	$35.50	$34.50	$28.50
No. 1 steel, Phila. area	38.50	37.00	35.00	22.75
No. 1 steel, Chicago	34.50	33.50	32.50	29.50
No. 1 bundles, Detroit	37.00	37.00	37.00	32.50
Low phos., Youngstown	38.50	35.50	35.50	29.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	43.50	42.50
No. 1 mach'y cast, Philadel'a	44.50	44.50	44.50	39.50
No. 1 mach'y cast, Chicago	47.00	46.50	44.50	39.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$36.50	$35.33	$34.00	$26.92
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$13.25	$13.25	$13.25	$14.38
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	36.00	36.00	36.00	30.00
Copper, Lake, Conn.	36.00	36.00	36.00	30.00
Tin, Straits, New York	95.00†	94.50	91.50	96.50
Zinc, East St. Louis	12.50	12.50	12.00	11.00
Lead, St. Louis	14.80	14.80	14.80	13.80
Aluminum, virgin ingot	23.20	23.20	23.20	21.50
Nickel, electrolytic	67.67	67.67	67.67	63.08
Magnesium, ingot	29.25	29.25	29.25	27.75
Antimony, Laredo, Tex.	28.50	28.50	28.50	25.50
† Tentative. ‡ Average. * Revised.				

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 115→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	$8.00	$8.50	$9.00	$9.50	.....
Birdsboro, Pa. *B6*	8.00	8.50	9.00	9.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *U4*	52.38	52.88	56.50	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	57.50	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Is. *P4*	56.00	56.50	56.50	.....	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
So. Chicago *R3*	56.00	.....	56.50	.....	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $66.25; Jackson, *J1, G1*, $65.00. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	347 Cb	410	416	430
Ingots, rerolling	16.75	17.75	19.25	19.00	29.75	23.50	25.50	14.00	—	14.25
Slabs, billets, rerolling	21.00	23.25	25.25	24.50	38.00	30.25	46.75	18.25	—	18.5
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.75	46.25	—	31.00	31.75	41.7
Billets, forging	30.00	30.25	32.75	31.75	48.25	36.00	54.75	24.00	24.50	24.5
Bars, wires, structurals	35.75	36.00	38.75	38.00	57.25	42.75	64.25	28.75	29.25	29.2
Plates	37.75	38.00	40.25	40.50	60.50	46.50	69.25	30.00	30.50	30.5
Sheets	41.75	42.00	49.25	44.50	64.50	51.25	77.50	34.25	41.25	34.7
Strip, hot-rolled	30.25	32.50	37.25	35.00	55.00	41.75	63.00	26.25	—	27.0
Strip, cold-rolled	38.75	42.00	46.00	44.50	64.50-64.75	51.25-51.50	77.50	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A5*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3* Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

Market Rally Gains Force

Prices move up again in strong market . . . Pittsburgh, Philadelphia and Chicago prices advance . . . Scrap moves out of quiet areas . . . Composite up.

◆ ACTION in all major centers left no doubt that the market is rallying and rallying strongly.

The story is the same; prices had dropped below the point where dealers would sell; short supplies gave added force to a rise that was due in the normal course of events.

Significant of the market's strength, scrap is moving out of quiet, low-price areas like Buffalo in large quantities. It is going both to Pittsburgh and Canada.

In New York a broker described the market as running wild in all directions. Domestic buying is strong; export is very good.

Chicago, Philadelphia, Pittsburgh, Cleveland, Youngstown, and St. Louis were among the areas showing broad gains. Reflecting steadily increasing market strength, THE IRON AGE Composite for No. 1 heavy melting steel moved up $1.17 to $36.50.

Pittsburgh . . . Market is up another $1 this week as brokers continued to pay premium prices for openhearth scrap. Dealer scrap is getting tighter all the time and price doesn't seem to make a difference right now. Unless brokers have long-term business associations with dealers, the dealers are sitting tight — even for premium prices. Dealers are getting around $37 a ton for anything they are willing to ship. No new mill activity is expected until labor negotiations are ended. A new tonnage of low phos was purchased at $40, up $2 from the last reported sale. Blast furnace grades are unchanged in view of a steady market.

Chicago . . . Chicago market was again moving up last week with a very strong outlook as fresh mill buying pegged previous prices or advanced to new levels. With plants due to begin closing for vacation shutdown in another couple of weeks, the dealer outlook seemed headed for greater strength. Despite the approach of vacation season, foundry grades were very strong last week and showed no slackening at the beginning of this week. Similarly, electric furnace grades were gaining strength. Turnings jumped another $1 in their second week of rising values.

Philadelphia . . . The firmer market tone, bubbling upward pricewise for the past several weeks, continues to strengthen all along the line. On the topside, price of No. 1 heavy melting is poised at $39.00—up $1.50 over last week's listing. No. 2 heavy melting, moving close behind, is pegged momentarily at $34.00 tops, while No. 2 bundles are resting at $30.00 on the topside, a $2 spurt above last week's list. Blast furnace grades are holding their own at the moment, with low phos grades up $1 average over earlier listings. Cast grades for the most part are holding steady. Dealers report intake into yards is averaging 80-90 pct of normal. Some slowdown in export shipments is reported in the face of an increasingly stronger domestic market.

New York . . . The market in this area is looking strong on both the domestic and export fronts. General price increases were recorded as continued demand runs into tight supply. Full entry of mills for new orders is expected when steel wage settlement is reached.

Detroit . . . Optimism was running through the market this week with both dealers and brokers predicting the July automotive lists will be up at least $1. Strength of the market in Pittsburgh, Chicago and the Valley could cause prices to go up here. A drop in auto production could also cause prices to rise if steel mill production stays the same.

Cleveland . . . Youngstown price went up $3 in 1 week on basis of buys by two mills in area and Cleveland market rose on freight differentials. Brokers and dealers are having some trouble covering new sales since collectors have grown bullish. Market strength is expected to continue in Valley and Cleveland. Dealers are also growing optimistic. Blast furnace gaining strength in Cleveland area with sales at $2 higher. Local foundry sales also continue strong.

Birmingham . . . Market in this area remains on the quiet side. Vacations and lull pending settlement of steel wage question appeared to keep the market from sharing in the strength of other districts.

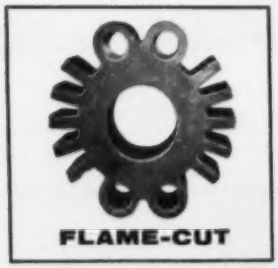
St. Louis . . . The scrap market is stronger with dealer steelmaking grades advancing $1 while railroad items moved up from $1 to $3 per ton on buying of offered lists. No. 1 RR heavy melting is up $1. Locomotive tires uncut, angles and splice bars are up $1.50; railroad specialties have advanced $1. The leading area consumer of borings and turnings advanced his prices $2 and steel operations continue at the high rate of 106.1 pct.

Cincinnati . . . No. 1 price made moderate rise of 50¢ as local dealers seek out-of-town markets due to approaching vacation shutdown of a local mill. No buying planned there until second week of July. Another major area mill expected to come into market late this week with moderate price and tonnage increase. No. 2 bundles remain glut on local market with sporadic barge shipments to Pittsburgh.

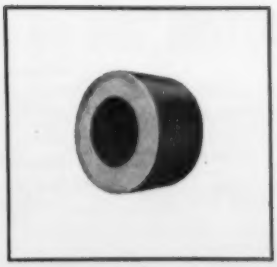
Buffalo . . . Dealers are disappointed over failure of local market to reflect strength of other centers. Large quantities of scrap are moving directly out of the local consuming area to Canada and Pittsburgh-Youngstown mills.

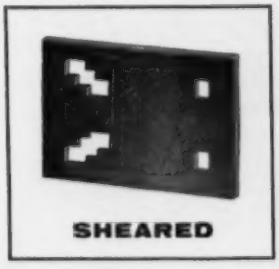
Boston . . . A little better feeling has followed stepped-up activity in this area. Prices went up last week for the first time in over a month. This week scattered price gains were registered.

West Coast . . . Export activity continues at a strong pace in San Francisco and Los Angeles. Mills say they're not short on scrap but admit they're not getting all they would like. Seattle prices firm.



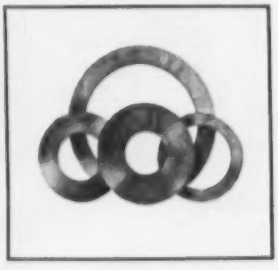
FLAME-CUT





SHEARED

HOW MUCH WOULD YOU SAVE WITH PRE-FORMED PARTS?



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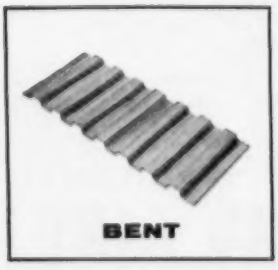

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LUKENS

STEEL PLATE SHAPES SERVICE

BY-PRODUCTS STEEL CO.

A Division of Lukens Steel Company, Coatesville, Pennsylvania

Scrap Prices *(Effective June 28, 1955)*

Pittsburgh

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	20.50 to 21.50
Mixed bor. and ms. turns.	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Cast iron borings	24.50 to 25.50
Low phos. punch'gs, plate	39.00 to 40.00
Heavy turnings	32.00 to 33.00
No. 1 RR. hvy. melting	36.50 to 37.50
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	50.00 to 51.00
RR. steel wheels	43.00 to 44.00
RR. spring steel	43.00 to 44.00
RR. couplers and knuckles	43.00 to 44.00
No. 1 machinery cast.	43.00 to 44.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	34.00 to 35.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 factory bundles	37.00 to 38.00
No. 1 dealers' bundles	34.00 to 35.00
No. 2 dealers' bundles	23.00 to 24.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	40.00 to 41.00
Low phos. punch'gs, plate	38.00 to 39.00
Low phos. 2 ft and under	37.00 to 38.00
No. 1 RR. hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	44.00 to 46.00
Rerolling rails	53.00 to 54.00
Rails 2 ft and under	50.00 to 51.00
Locomotive tires, cut	37.00 to 38.00
Cut bolsters & side frames	39.00 to 40.00
Angles and splice bars	46.00 to 47.00
RR. steel car axles	44.00 to 45.00
RR. couplers and knuckles	43.00 to 44.00
No. 1 machinery cast.	46.00 to 48.00
Cupola cast.	42.00 to 44.00
Heavy breakable cast.	32.00 to 34.00
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	38.00 to 39.00
Malleable	45.00 to 46.00
Stove plate	34.00 to 35.00

Philadelphia Area

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	28.00 to 30.00
Machine shop turn.	21.00 to 22.00
Mixed bor. short turn.	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 5 ft and under	40.00 to 41.00
Low phos. 2 ft and under	41.00 to 42.00
Low phos. punch'gs	41.00 to 42.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	33.00 to 34.00
RR. steel wheels	40.50 to 41.50
RR. spring steel	40.50 to 41.50
Rails 18 in. and under	50.00 to 51.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	45.00 to 46.00
Malleable	44.00 to 45.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	44.00 to 45.00

Cleveland

No. 1 hvy. melting	$34.50 to $35.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 bundles	34.50 to 35.50
No. 2 bundles	24.00 to 25.00
No. 1 busheling	34.50 to 35.50
Machine shop turn.	18.00 to 20.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	23.00 to 25.00
Cast iron borings	24.00 to 25.00
Cut struct'r'l & plates, 2 ft & under	42.00 to 43.00
Drop forge flashings	34.50 to 35.50
Low phos. punch'gs, plate	35.00 to 36.00
Foundry steel, 2 ft & under	38.50 to 39.50
No. 1 RR. heavy melting	37.00 to 38.00
Rails 2 ft and under	50.00 to 51.00
Rails 18 in. and under	49.00 to 50.00
Railroad grate bars	26.00 to 27.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	46.00 to 47.00
Stove plate	44.00 to 45.00
Malleable	45.00 to 46.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	38.00 to 39.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.50 to 25.50
No. 1 busheling	29.00 to 30.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Low phos. plate	32.00 to 33.00
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	36.00 to 37.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles, openhearth	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
New busheling	26.50 to 27.50
Drop forge flashings	26.00 to 27.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.50 to 15.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	15.50 to 16.50
Low phos. punch'gs, plate	27.50 to 28.50
No. 1 cupola cast.	35.00 to 37.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	31.00 to 32.00
Automotive cast.	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	24.50 to 25.50
Machine shop turn.	17.50 to 18.50
Cast iron borings	19.50 to 20.50
Shoveling turnings	19.50 to 20.50
No. 1 RR. hvy. melting	36.00 to 37.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	49.00 to 50.00
Locomotive tires uncut	38.00 to 39.00
Angles and splice bars	38.00 to 39.00
Std. steel car axles	37.50 to 38.00
RR. specialties	38.00 to 39.00
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	34.00 to 35.00
Cast iron brake shoes	32.00 to 33.00
Stove plate	35.00 to 36.00
Cast iron car wheels	35.00 to 36.00
Malleable	35.00 to 36.00
Unstripped motor blocks	33.50 to 34.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	21.50 to 22.50
No. 1 bundles	28.00 to 29.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	28.00 to 29.00
Elec. furnace, 2 ft & under	32.50 to 33.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and short turn.	15.00 to 15.50
Shoveling turnings	16.25 to 16.75
Clean cast chem. borings	17.00 to 18.00
No. 1 machinery cast.	30.00 to 31.00
Mixed cupola cast.	28.00 to 29.00
Heavy breakable cast.	29.00 to 30.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.50
No. 2 hvy. melting	29.50
No. 2 bundles	$23.50 to 24.50
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Clean cast chem. borings	21.00 to 22.00
No. 1 machinery cast.	35.00 to 37.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	31.00 to 32.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft	36.00 to 37.00
No. 1 RR. hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	40.00 to 41.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	43.00 to 44.00
Shoveling turnings	24.00 to 25.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	34.50 to 35.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 bundles	31.50 to 32.50
No. 2 bundles	23.00 to 24.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	17.50 to 18.50
Shoveling turnings	22.00 to 23.00
Cast iron borings	17.50 to 18.50
Low phos., 18 in. & under	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	40.00 to 41.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	45.00 to 46.00

San Francisco

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 3 bundles	21.00
Machine shop turn.	10.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	40.00

Los Angeles

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	20.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under	30.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	$41.00 to 42.00

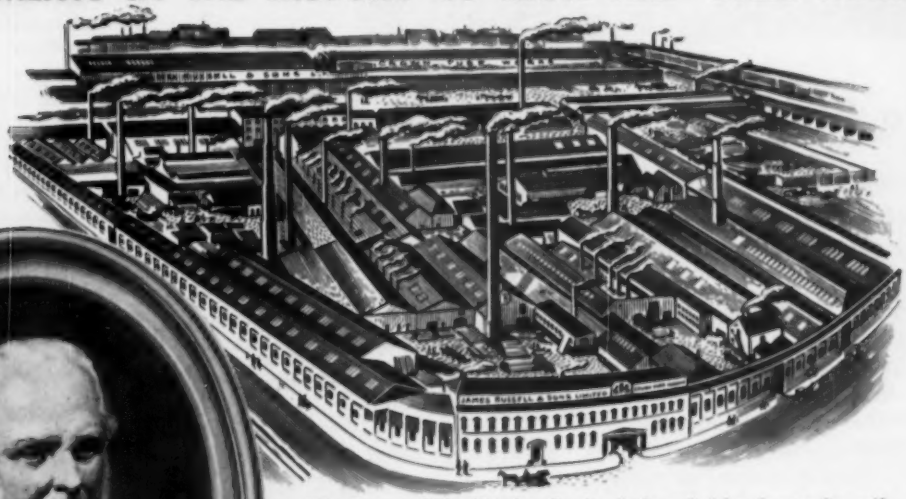
Seattle

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Bushelings	29.00
Bush., new fact prep'd	32.00
Bush., new fact unprep'd	28.00
Machine shop turn.	16.00
Short steel turnings	21.00
Mixed bor. and turn.	$16.00 to 17.00
Rails, rerolling	43.00
Cast scrap	42.00 to 45.00

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING



Cornelius Whitehouse

Art research, courtesy A. F. Nuttle, Borough Librarian, Wednesfield, Staffs.

The Crown Tube Works, England, founded by James Russell, where Whitehouse was employed in 1825 . . . *this is the eighth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.*

1825 – The Invention of Wrought Iron Tube

Until Cornelius Whitehouse succeeded in forming a commercially perfect tube, "the manufacture and use of coal gas simply hung fire."

The old process, which consisted of heating the plate and welding with the use of a mandrel produced tubes only 4 feet long. The method was costly and tedious.

Whitehouse's plan was to draw the skelp, uniformly heated to the proper temperature, through a hollow bell-shaped metal die. This made the tubes longer and of a more convenient length. He followed this by inventing machinery to straighten, bend and prove his tube as well as a solution for jointing.

Although there have been many changes through the years, the process of making pipe has remained essentially the same. Few inventions in the iron and steel industry have proved so rewarding. Today, pipe is one of the most widely used of all steel products—for home and industry.

These special steels require special scrap of known analysis, a problem particularly suited to our experience, personnel, equipment and the strategic locations of our offices. Possibly our facilities may help you solve a problem in iron or steel scrap.

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No Slump Coming for Copper

Demand for refined copper won't slow up in usually quiet third quarter . . . Mills will try to build up inventories if they get the chance . . . ODM sees aluminum squeeze easing.

◆ THERE WON'T be any easing in the demand for refined copper in the third quarter, despite the fact that this is usually the time when there is a seasonal dip.

Offsetting the customary seasonal slump in demand is the fact that this year many mills will keep on buying copper to build up badly depleted inventories. Also, European demand, especially from West Germany, will continue strong throughout the year.

For reasons that are hard to pin down, copper on the London Metal underwent a sharp price decline last week, dropping almost 3¢ per lb. One possible explanation of the price dip is the fact that there were rumors that the more-than-month-long strike of the British dockworkers might be coming to an end. However, at the end of the week the price had started to rebound.

One effect of the decline in the LME copper price was a slight reduction in the copper scrap prices over here.

Analyzing the copper situation for the National Assn. of Purchasing Agents, E. S. Goodwin, Westinghouse, came up with several concrete suggestions on what copper buyers should do. They apply especially to those who are frustrated by the scarcity of the metal and upset by its high price:

(1) Copper buyers should forecast more accurately their metal requirements in an effort to get better planning in their long-range buying programs.

(2) They should tell their suppliers more about their long range plans.

(3) Put more emphasis on programs for finding substitute metals that can be used in place of copper.

ALUMINUM . . . Government expects third quarter aluminum supply to be slightly in excess of demand during the third quarter. Office of Defense Mobilization estimates total third quarter supply at 557,000 tons compared with demand, including export requirements, totaling 525,000 tons.

ODM's evaluation of the aluminum outlook for the third quarter was confused somewhat during the week due to a typographical error which was picked up by several newspapers. The error was sufficiently large to indicate that ODM thought there would be a slight excess of demand over supply, rather than its actual estimate that supply will be somewhat above demand.

However, it may be that the typo-version of the ODM report will be the more accurate. There may be some easing in demand for aluminum during the third quarter, but it's a safe bet the metal won't be coming out anyone's ears.

According to the agreement reached between Alcoa, Reynolds, Kaiser and government officials, of the 100,000 tons of aluminum recently diverted from the stockpile, two-thirds will go to nonintegrated users in raw form, and one-third will be retained by the producers for semifabricating and fabricating to fill contract obligations. About 11,500 tons, however, will be set aside to fill defense contracts by government order.

House Small Business committee which is investigating the need for a third round government-assisted aluminum expansion program also intends to look into the effect of present government stockpile policies on the price of aluminum.

Alcoa last week officially started work on its $30 million expansion program at its Davenport, Ia., fabricating plant. Money invested in the plant is being spent this way: $10 million ($6 million coming from the Air Force) for an 8000 ton capacity aluminum plate stretcher; $20 million for a 160-in. rolling mill, and other facilities.

TITANIUM . . . Mallory-Sharon Titanium Corp. has applied for a fast tax writeoff certificate on new facilities which would expand its titanium metal production. Cost of the expansion would be $14.5 million.

MERCURY . . . Price continues in steep decline. Since the middle of March when mercury was quoted at $324 per 76-lb flask, the price has plummeted to a level early this week of $281-$283. Demand by the government has fallen off considerably and industrial users are staying out of the market too.

ZINC, LEAD . . . Demand for Special High grade zinc continues far in excess of demand. There has been a slight easing in demand for Prime Western ever since the price was upped to 12.50¢ per lb.

Lead demand is reported as satisfactory and indications are the price will remain stable at 15¢ per lb for some time to come.

COPPER . . . Unfilled orders for brass mill and copper wire mill products rose markedly in the first quarter of this year, reports Business & Defense Services Administration. Unfilled orders for brass mill products rose from an estimated 241 million lb at the end of 1954 to 360 million lb at the end of March. Unfilled orders for copper wire rose from 167 million lb to 227 million lb during the same period.

Shipments of these commodities also rose, but at a less rapid pace than orders.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	June 22	June 23	June 24	June 25	June 27	June 28
Copper, electro, Conn.	36.00	36.00	36.00	36.00	36.00	36.00
Copper, Lake, delivered	36.00	36.00	36.00	36.00	36.00	36.00
Tin, Straits, New York	94.50	94.50	94.875	....	94.50	94.50*
Zinc, East St. Louis	12.00	12.50	12.50	12.50	12.50	12.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices **Tentative*

Nonferrous Prices *(Effective June 28, 1955)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet			Plate
	0.032 in.	0.081 in.	0.136-0.249 in.	0.250-3.000 in.
1100, 3003	39.1	37.1	35.9	35.5
3004	44.0	39.8	38.1	37.6
5052	46.7	41.9	40.2	39.3
2024-O, -OAL	49.4	40.8	39.3	39.4
7075-O, -OAL	60.8	49.1	46.8	46.8

Extruded Solid Shapes: Shape factors 1 to 6, 38.7¢ to 86.7¢; 12 to 14, 39.4¢ to $1.04; 24 to 26, 42.2¢ to $1.35; 36 to 38, 49.8¢ to $1.97.

Rod, Round: Rolled, 1.064-4-5 in., 1100-F, 48.6¢ to 40.1¢; cold finished, 0.375-3.499 in., 1100-F, 47.9¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T3, ⅛-11/32 in., 63.5¢ to 50.1¢; ⅜-1½ in., 49.9¢ to 46.9¢; 1 9/16-3 in., 45.7¢ to 42.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 1100, 47.1¢ to 35.8¢; 5052, 56.7¢ to 44.4¢; 2017-T4, 64.3¢ to 44.7¢; 6061-T4, 59.5¢ to 44.1¢.

Extruded Tubing: Rounds, 6063-T5, OD 1¼-2 in., 44.4¢ to 64.8¢; 2-4 in., 40.3¢ to 54.6¢; 4-6 in., 40.8¢ to 49.8¢; 6-9 in., 41.4¢ to 52.1¢.

Roofing sheet: Flat, per sheet, 0.032-in., 42¾ x 60-in., $2.995; x 96-in., $4.801; x 120-in., $6.002; x 144-in., $7.202. Coiled sheet, per lb, 0.019 in. x 28 in., 30.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 59¢; 3/16 in., 60¢; ½ in., 59¢; 0.064 in., 76¢; 0.032 in., 97¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 79¢; ⅓ to ⅝ in., 62.5¢; 1¼ to 1.749 in., 59¢; 2½ to 5 in., 54.5¢. Other alloys higher. Base up to ⅝ in. diam, 10,000 lb; ⅝ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 67.3¢; 0.22 to 0.25 lb, 5.9 in., 64.3¢; 0.50 to 0.59 lb, 8.6 in., 61.7¢; 1.8 to 2.59 lb, 19.5 in., 59.8¢; 4 to 6 lb, 28 in., 55¢. Other alloys higher. Base, in weight per ft of shape: Up to ⅓ lb, 10,000 lb; ⅓ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.46; 5/16 to ⅜ in., $1.32; ½ to ⅝ in., 99¢; 1 to 2 in., 82¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 67¢; 1 to 2 in., 63¢; 3 to 4 in., 62¢. Other alloys higher. Base OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $14.00-$14.50; alloy $16.50; Plate, HR, commercially pure, $11.50-$12.00; alloy, $12.50-$12.75; Wire, rolled and/or drawn, commercially pure, $10.50-$11.00; alloy, $12.50; Bar, HR or forged, commercially pure, $8.50-$8.75; alloy, $8.50-$9.00.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	122	105	153
Shot, Blocks		85	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	52.79		54.86
Copper, h-r	54.76	51.11	
Copper, drawn		52.36	
Low brass	49.75	49.69	
Yellow brass	46.27	46.21	
Red brass	50.99	50.93	
Naval brass		44.30	45.56
Leaded brass			43.09
Com. bronze	52.78	52.72	
Mang. bronze	53.73	47.83	49.39
Phos. bronze	73.03	73.53	
Munts metal	48.14	43.95	45.20
Ni silver, 10 pct	60.20	63.28	66.34

Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.

Strip	$1.74
Rod, bar, wire	1.71

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	23.20
Aluminum pig	21.50
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd Be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	36.00
Copper, Lake, delivered	36.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$90 to $100
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	28.50
ingot	29.25
Magnesium, sticks, 100 to 500 lb	49.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$281 to $283
Nickel electro, f.o.b. N. Y. warehouse	67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$20 to $21
Platinum, dollars per troy oz.	$77 to $80
Silver, New York, cents per troy oz.	89.25
Tin, New York	95.00
Titanium, sponge, grade A-1	$3.95
Zinc, East St. Louis	12.50
Zinc, New York	13.00
Zirconium, sponge	$10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	34.50
No. 120	33.75
No. 123	33.25
80-10-10 ingot	
No. 305	38.00
No. 315	36.25
88-10-2 ingot	
No. 210	47.25
No. 215	43.75
No. 245	39.75
Yellow ingot	
No. 405	29.25
Manganese bronze	
No. 421	31.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	27.50-28.50
0.60 copper, max.	27.25-28.25
Piston alloys (No. 122 type)	26.50-28.50
No. 12 alum. (No. 2 grade)	26.00-26.50
108 alloy	26.00-26.50
195 alloy	27.00-28.00
13 alloy (0.60 copper max.)	27.25-28.25
ASX-679	26.00-26.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	26.00-27.00
Grade 2—92-95%	25.00-26.00
Grade 3—90-92%	24.50-25.00
Grade 4—85-90%	23.50-24.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.92
Electrodeposited	39.78
Flat rolled	45.42
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	90.50*
Cadmium	$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	62.00
Copper sulphate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	31.25*
Nickel chloride, 300 to 400 lb	43.50*
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

* Effective Jan. 3.

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	32	31¼
Yellow brass	23¾	22
Red brass	28¼	27⅝
Comm. bronze	29¼	28⅛
Mang. bronze	22 1/6	21⅝
Yellow brass rod ends	23⅝	22

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	35
No. 2 copper wire	33⅛
Light copper	31⅝
*Refinery brass	31⅛

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	35
No. 2 copper wire	33½
Light copper	31⅝
No. 1 composition	28
No. 1 comp. turnings	27½
Rolled brass	20½—21
Brass pipe	19½—20
Radiators	21½—21⅝
Aluminum	
Mixed old cast	15½—16½
Mixed new clips	17 —18½
Mixed turnings, dry	16 —17½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	32½—33
No. 2 heavy copper and wire	31½—32
Light copper	29½—30
New type shell cuttings	28½—29
Auto radiators (unsweated)	18½—19
No. 1 composition	25 —25½
No. 1 composition turnings	24½—25
Unlined red car boxes	19 —19½
Cocks and faucets	20 —20½
Mixed heavy yellow brass	17 —17½
Old rolled brass	18½—19
Brass pipe	20 —20½
New soft brass clippings	22½—23
Brass rod ends	21½—22
No. 1 brass rod turnings	20½—21
Aluminum	
Alum. pistons and struts	12 —12⅛
Aluminum crankcases	12 —12⅛
1100 (2S) aluminum clippings	15 —15½
Old sheet and utensils	12 —12⅛
Borings and turnings	8½— 9
Misc. cast aluminum	13 —12½
2024 (24s) clippings	14 —14½
Zinc	
New zinc clippings	7 — 7⅛
Old zinc	5 — 5½
Zinc routings	3½— 3¾
Old die cast scrap	3½— 3¾
Nickel and Monel	
Pure nickel clippings	80
Clean nickel turnings	65
Nickel anodes	80
Nickel rod ends	80
New Monel clippings	38½
Clean Monel turnings	29½
Old sheet Monel	34½
Nickel silver clippings, mixed	18½—19
Nickel silver turnings, mixed	16½—17
Lead	
Soft scrap lead	11½—12
Battery plates (dry)	6½— 6¾
Batteries, acid free	4½
Magnesium	
Segregated solids	18½—19
Castings	17½—18
Miscellaneous	
Block tin	78 —80
No. 1 pewter	60 —61
No. 1 auto babbitt	50
Mixed common babbitt	14½
Solder joints	18 —19
Siphon tops	42
Small foundry type	16½
Monotype	15
Linc. and stereotype	14 —14¼
Electrotype	12 —12¼
Hand picked type shells	10½—11
Lino. and stereo. dross	4¾— 5
Electro dross	3½— 4

IRON AGE

STEEL PRICES

(Effective June 28, 1965)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$86.00 *B3*		4.30 *B3*	6.45 *B3*	4.30 *B3*						
	Buffalo, N. Y.	$64.00 *B3*	$78.00 *B3, R3*	$86.00 *B3, R3*	5.075 *B3*	4.30 *B3*	6.45 *B3*	4.30 *B3*	4.95 *B3,R3*	5.75 *R7,S10*	6.15 *B3*	8.425 *B3*		
	Claymont, Del.													
	Harrison, N. J.													12.45 *C11*
	Conshohocken, Pa.								4.10 *A2*	5.80 *A2*	6.15 *A2*			
	New Bedford, Mass.									6.20 *R6*				
	Johnstown, Pa.	$64.00 *B3*	$78.00 *B3*	$86.00 *B3*		4.30 *B3*	6.45 *B3*		4.95 *B3*					
	Boston, Mass.									6.30 *T8*				12.80 *T8*
	New Haven, Conn.									6.20 *D1* 6.50 *A5*				
	Phoenixville, Pa.					4.20 *P2*		4.30 *P2*						
	Sparrows Pt., Md.								4.95 *B3*	5.75 *B3, T8*	6.15 *B3*	8.425 *B3*		
	Bridgeport, Wallingford, Conn.	$69.00 *N8*	$83.00 *N8*						4.35 *N8*	6.20 *W1*			7.00 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.30 *N7* 6.60 *A5*				12.75 *A5* 12.80 *N7*
MIDDLE WEST	Alton, Ill.								4.225 *L1*					
	Ashland, Ky.								4.05 *A7*					
	Canton-Massillon, Dover, Ohio		$80.00 *R3*	$86.00 *R3, T5*										12.45 *G6*
	Chicago, Ill.	$64.00 *U1*	$78.00 *R3, U1,W8*	$86.00 *U1, W8,R3*	5.075 *U1*	4.25 *U1, W8*	6.40 *U1, Y1*	4.25 *U1*	4.05 *A1,N4, W8*	5.85 *A1,T8*				12.45 *T8*
	Cleveland, Ohio									5.75 *A5,J3*		8.60 *A5*		12.45 *A5*
	Detroit, Mich.			$86.00 *R5*					4.15 *G3,M2*	5.85 *D1,D2, G3,M2,P11*	6.25 *G3*	8.70 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$64.00 *U1*	$78.00 *U1*	$86.00 *U1, Y1*	5.075 *J3*	4.25 *J3, U1*	6.40 *U1, J3*		4.05 *J3, U1,Y1*	5.85 *J3*	6.15 *U1, J3,Y1*	8.60 *Y1*	6.70 *U1, Y1*	
	Sterling, Ill.								4.15 *N4*					
	Indianapolis, Ind.									5.90 *C5*				
	Newport, Ky.												6.70 *Y5*	
	Middletown, Ohio									5.75 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								4.05 *S1,R3*	5.75 *S1,R3, T4*	6.15 *S1, R3*	8.60 *S1, R3*	6.70 *S1*	12.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$64.00 *U1, J3*	$78.00 *J3, U1,C11*	$86.00 *U1, C11*	5.075 *U1*	4.25 *J3, U1*	6.40 *J3, U1*	4.25 *U1*	4.05 *P6*	5.75 *B4,J3, S3*			6.70 *S9*	12.45 *S9*
	Portsmouth, Ohio								4.05 *P7*	5.75 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.25 *W3*			4.05 *W3*	5.75 *F3,W3*	6.15 *W3*	8.60 *W3*		
	Youngstown, Ohio		$78.00 *C10*	$86.00 *Y1, C10*		4.25 *Y1*	6.40 *Y1*		4.05 *U1,Y1*	5.75 *Y1,C5*	6.15 *U1, Y1*	8.60 *Y1*	6.70 *U1, Y1*	12.45 *C5*
WEST	Fontana, Cal.	$72.00 *K1*	$86.00 *K1*	$105.00 *K1*		4.90 *K1*	7.05 *K1*	5.25 *K1*	4.825 *K1*	7.50 *K1*	7.25 *K1*		8.10 *K1*	14.55 *K1*
	Geneva, Utah		$78.00 *C7*			4.25 *C7*	6.40 *C7*							
	Kansas City, Mo.					4.30 *S2*	6.45 *S2*				6.40 *S2*		6.95 *S2*	
	Los Angeles, Torrance, Cal.		$87.50 *B2*	$106.00 *B2*		4.95 *B2, C7*	7.10 *B2*		4.80 *B2,C7*	7.80 *C1*				
	Minnequa, Colo.					4.70 *C6*			5.15 *C6*					
	Portland, Ore.					5.00 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$87.50 *B2*			4.90 *B2* 4.95 *P9*	7.05 *B2*		4.80 *B2,C7*					
	Seattle, Wash.		$91.50 *B2*			5.00 *B2*	7.15 *B2*		5.05 *B2, P12*					
SOUTH	Atlanta, Ga.								4.25 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$64.00 *T2*	$78.00 *T2*			4.25 *C16, R3,T2*	6.40 *T2*		4.05 *R3, T2,C16*		6.15 *T2*			
	Houston, Lone Star, Tex.	$70.00 *L3*	$83.00 *S2*	$91.00 *S2*		4.30 *S2*	6.45 *S2*				6.40 *S2*		6.95 *S2*	

IRON AGE

STEEL PRICES

(Effective June 28, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Hollowware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.05 *B3*	4.95 *B3*				6.10 *B3*	7.50 *B3*			4.675 *W6*	† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.10. Differential 1.00 lb./0.25 lb. add 85¢.		
	Claymont, Del.													
	Conshohocken, Pa.													
	Coatesville, Pa.	4.10 *A2*	5.00 *A2*				6.15 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.675 *B3*			
	Fairless, Pa.	4.10 *U1*	5.00 *U1*				6.15 *U1*	7.55 *U1*				$8.90 *U1*	$7.60 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.05 *B3*	4.95 *B3*	5.45 *B3*			6.10 *B3*	7.50 *B3*	8.20 *B3*		4.775 *B3*	$8.90 *B3*	$7.60 *B3*	
	Worcester, Mass.										4.975 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										4.85 *L1*			
	Ashland, Ky.	4.05 *A7*		5.45 *A7*	5.375 *A7*									
	Canton-Massillon, Dover, Ohio			5.45 *R1, R3*						5.175 *R1*				
	Chicago, Joliet, Ill.	4.05 *A1, W8*					6.10 *U1*				4.675 *A5, N4, R3*			
	Sterling, Ill.										4.775 *N4*			
	Cleveland, Ohio	4.05 *J3, R3*	4.95 *J3, R3*		5.375 *R3*		6.10 *J3, R3*	7.50 *J3, R3*			4.675 *A5*			
	Detroit, Mich.	4.15 *G3, M2*	5.05 *G3*				6.20 *G3*	7.60 *G3*						
	Newport, Ky.	4.05 *N5*	4.95 *N5*	5.45 *N5*										
	Gary, Ind. Harbor, Indiana	4.05 *I3, U1, Y1*	4.95 *I3, U1, Y1*	5.45 *U1, I3*	5.375 *I3, U1*	5.85 *U1*	6.10 *U1, I3, Y1*	7.50 *U1, Y1*			4.675 *Y1*	$8.80 *I3, U1, Y1*	$7.50 *I3, U1, Y1*	6.20 *U1, Y1*
	Granite City, Ill.	4.25 *G2*	5.15 *G2*	5.65 *G2*	5.575 *G2*								$7.60 *G2*	6.30 *G2*
	Kokomo, Ind.	4.15 *C9*		5.55 *C9*						5.20 *C9*	4.775 *C9*			
	Mansfield, Ohio					5.85 *E2*				5.175 *E2*				
	Middletown, Ohio		4.95 *A7*	5.45 *A7*	5.375 *A7*	5.85 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.05 *S1, R3* 5.30 *N3*	4.95 *R3* 5.975 *N3*	5.45 *N3, R3*	6.725 *N3*	5.85 *N3*	6.10 *S1, R3*	7.50 *R3*				$8.80 *R3*	$7.50 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 *J3, U1, P6*	4.95 *J3, U1, P6*	5.45 *U1*	5.375 *U1*		6.10 *J3, U1*	7.50 *J3, U1*	8.20 *U1*		4.675 *A5* 4.875 *P6*	$8.80 *J3, U1*	$7.50 *J3, U1*	6.20 *U1*
	Portsmouth, Ohio	4.05 *P7*	4.95 *P7*								4.675 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 *W3, W5*	4.95 *W3, W5, F3*	5.45 *W3, W5*		5.85 *W3, W5*	6.10 *W3*	7.50 *W3*				$8.80 *W3, W5*	$7.50 *W3, W5*	6.20 *F3, W5*
	Youngstown, Ohio	4.05 *U1, Y1*	4.95 *Y1*		5.375 *Y1*		6.10 *U1, Y1*	7.50 *Y1*			4.675 *Y1*			
WEST	Fontana, Cal.	4.825 *K1*	6.05 *K1*				6.875 *K1*	8.55 *K1*			5.475 *K1*			
	Geneva, Utah	4.15 *C7*												
	Kansas City, Mo.										4.925 *S2*			
	Los Angeles, Torrance, Cal.										5.475 *C7, B2*			
	Minnequa, Colo.										4.925 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	4.75 *C7*	5.90 *C7*	6.20 *C7*							5.325 *C7*	$9.55 *C7*	$8.25 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.05 *R3, T2*	4.95 *T2*	5.45 *R3, T2*			6.10 *T2*			5.35 *R3*	4.675 *T2, R3*	$8.90 *T2*	$7.60 *T2*	
	Houston, Tex.										4.925 *S2*			

IRON AGE

STEEL PRICES

(Effective June 28, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.075 *B3*	6.625 *B3*	6.45 *B3*					
	Buffalo, N. Y.	4.30 *B3,R3*	4.30 *B3,R3*	5.45 *B5*	5.075 *B3,R3*	6.625 *B3,B5*	6.45 *B3*	4.225 *B3,R3*			6.45 *B3*	5.75 *W6*
	Claymont, Del.							4.225 *C4*		5.80 *C4*		
	Centreville, Pa.							4.225 *L4*		5.80 *L4*	6.45 *L4*	
	Conshohocken, Pa.							4.225 *A2*	5.275 *A2*		6.45 *A2*	
	Harrisburg, Pa.							4.225 *C3*	5.275 *C3*			
	Hartford, Conn.			5.90 *R3*		6.925 *R3*						
	Johnstown, Pa.	4.30 *B3*	4.30 *B3*		5.075 *B3*		6.45 *B3*	4.225 *B3*		5.80 *B3*	6.45 *B3*	5.75 *B3*
	Fairless, Pa.	4.45 *U1*	4.45 *U1*		5.225 *U1*							
	Newark, N. J.			5.85 *W10*		6.80 *W10*						
	Camden, N. J.			5.85 *P10*								
	Bridgeport, Putnam, Conn.	4.55 *N8*		5.85 *W10*	5.225 *N8*			4.475 *N8*				
	Sparrows Pt., Md.		4.30 *B3*					4.225 *B3*		5.80 *B3*	6.45 *B3*	5.85 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85 *W11* 5.95 *B5,C14*		6.925 *A5,B5*						6.05 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.925 *L1*
	Ashland, Newport, Ky.							4.225 *A7,N5*		5.80 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.40 *R3*		5.40 *R2,R3*	5.075 *R3,T5*	6.625 *R2,R3, T5*		4.225 *E2*				
	Chicago, Joliet, Ill.	4.30 *U1, N4,W8,R3, P13*	4.30 *N4,R3, P13*	5.40 *A5,W10, W8,B5,L2*	5.075 *U1,R3, W8*	6.625 *A5,W8, W10,L2,B5*		4.225 *U1,W8, I3,A1,R3*	5.275 *U1*	5.80 *U1*	6.45 *U1*	5.75 *A5, R3,N4,W7*
	Cleveland, Ohio	4.30 *R3*	4.30 *R3*	5.40 *A5,C13*		6.625 *A5,C13*	6.45 *R3*	4.225 *J3,R3*	5.275 *J3*		6.45 *J3,R3*	5.75 *A5, C13*
	Detroit, Mich.	4.40 *G3* 4.45 *R5*		5.40 *R5* 5.65 *B5,P8* 5.65 *P3*	5.075 *R5* 5.175 *G3*	6.625 *R5* 6.825 *B5,P3 P8*	6.55 *G3*	4.325 *G3*			6.55 *G3*	
	Duluth, Minn.											5.75 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.30 *I3, U1, Y1*	4.30 *I3, U1, Y1*	5.40 *M5,R3,*	5.075 *I3, U1, Y1*	6.625 *M5, R3*	6.45 *U1,I3, Y1*	4.225 *I3, U1,Y1*	5.275 *I3*	5.80 *U1,Y1*	6.45 *U1,I3, Y1*	5.85 *M4*
	Granite City, Ill.							4.425 *G2*				
	Kokomo, Ind.											5.85 *C9*
	Sterling, Ill.	4.40 *N4*	4.40 *N4*									5.85 *N4*
	Niles, Ohio Sharon, Pa.	4.30 *R3*					6.45 *R3*	4.225 *S1,R3*		5.80 *S1*	6.45 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.30 *J3, U1, C11*	4.30 *J3, U1*	5.40 *A5,C8, C11,J3 W10,B4,R3*	5.075 *U1,C11*	6.625 *A5,C11, W10,C8,R3*	6.45 *J3, U1*	4.225 *J3, U1*	5.275 *U1*	5.80 *U1*	6.45 *J3, U1*	5.75 *A5,J3, P6*
	Portsmouth, Ohio											5.75 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.225 *W3, W5*				
	Youngstown, Ohio	4.30 *U1,Y1, C10,R3*	4.30 *U1,Y1, R3*	5.40 *F2,Y1, C10*	5.075 *U1,Y1, C10*	6.625 *Y1,C10* 6.665 *F2*	6.45 *U1,Y1*	4.225 *U1,Y1, R3*		5.80 *Y1*	6.45 *Y1*	5.75 *Y1*
WEST	Emeryville, Cal.	5.05 *J5*	5.05 *J5*									
	Fontana, Cal.	5.00 *K1*	5.00 *K1*		6.125 *K1*		7.70 *K1*	4.875 *K1*		6.45 *K1*	7.15 *K1*	
	Geneva, Utah							4.225 *C7*			6.45 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.325 *S2*		6.70 *S2*					6.00 *S2*
	Los Angeles, Torrance, Cal.	5.00 *B2,C7*	5.00 *B2,C7*	5.85 *R3*	6.125 *B2*		7.15 *B2*					6.70 *B2*
	Minnequa, Colo.	4.75 *C6*	4.75 *C6*					5.075 *C6*				6.00 *C6*
	Portland, Ore.	5.05 *O2*	5.05 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.00 *C7,P9* 5.05 *B2*	5.00 *C7,P9* 5.05 *B2*				7.20 *B2*					6.70 *C7*
	Seattle, Wash.	5.05 *B2,P12, N6*	5.05 *B2,P12*				7.20 *B2*	5.125 *B2*		6.70 *B2*	7.35 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.95 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.30 *T2,C16, R3*	4.30 *T2,C16, R3*				6.45 *T2*	4.225 *T2,R3*			6.45 *T2*	5.75 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.325 *S2*		6.70 *S2*	4.55 *L3* 4.275 *S2*		5.85 *S2*	6.50 *S2*	6.00 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0								
Youngstown *R3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Fontana *K1*	10.75	+4.5	13.75	+0.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0								
Pittsburgh *J3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Alton, Ill. *L1*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0								
Sharon *M3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Fairless *N2*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0								
Pittsburgh *N1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling *W5*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Wheatland *W4*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Youngstown *Y1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor *Y1*	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0								
Lorain *N2*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0								
Youngstown *R3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0								
Fairless *N2*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0								
Fontana *K1*	14.25		18.25		20.25		20.75		21.25		21.75		22.25									
Pittsburgh *J3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75
Alton, Ill. *L1*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.25	32.75	19.25	33.25	18.0								
Sharon *M3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0								
Pittsburgh *N1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75
Wheeling *W5*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0								
Wheatland *W4*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0								
Youngstown *Y1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75
Indiana Harbor *Y1*	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0								
Lorain *N2*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75

Threads only, buttweld and seamless 2¼ pt higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt higher discount. Buttweld jobbers discount, 5 pct. Galvanized discounts based on zinc price range of over 9¢ to 11¢ incl. per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.50¢ per lb.

Steel Prices *(Effective June 28, 1955)*

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.45	5.35	5.425				
So. Chicago *R3*				7.30			
Ensley *T2*	4.45	5.35					
Fairfield *T2*		5.35		7.30		5.275	
Gary *U1*	4.45	5.35				5.275	
Ind. Harbor *I3*	4.45		5.425	7.30		5.275	
Johnstown *B3*		5.35					
Joliet *U1*		5.35	5.425				
Kansas City *S2*				7.30			11.50
Lackawanna *B3*	4.45	5.35	5.425			5.275	
Minnequa *C6*	4.45	5.85	5.425	7.30		5.275	11.50
Pittsburgh *O1*					11.00		11.50
Pittsburgh *P5*					11.00		11.50
Pittsburgh *J3*				7.30			
Seattle *B2*				7.80		5.425	12.00
Stockton *B3*	4.45		5.425			5.275	
Struthers *Y1*				7.30			
Torrance *C7*						5.425	
Williamsport *S5*		5.35					
Youngstown *R3*				7.30			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50	Grain Oriented	
Trans. 58	13.00	Trans. 80	16.60
Trans. 52	14.00	Trans. 73	17.10

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).
* Coils 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire, Fence 9-15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	137	146		155	159	6.90	7.30
Aliquippa, Pa. *J3*	137	149			156	6.90	7.45
Atlanta *A8*	139	151		157	164	7.00	7.525
Bartonville *K2*	139	151		157	164	7.00	7.55
Buffalo *W6*						6.90	7.30
Chicago, Ill. *N4*	137	150		155	163	6.90	7.475
Cleveland *A6*	142						
Cleveland *A5*						6.90	
Crawfordsville *M4*	139	151		157	159	7.00	7.55
Donora, Pa. *A5*	137	149		155	162	6.90	7.45
Duluth *A5*	137	149	150	155	162	6.90	7.45
Fairfield, Ala. *T2*	137	149		155	162	6.90	7.45
Galveston *D4*	139						
Houston *S2*	142	154			164	7.15	7.70
Johnstown, Pa. *B3*	137	149			162	6.90	7.45
Joliet, Ill. *A5*	137	149		155	162	6.90	7.45
Kokomo, Ind. *C9*	139	148		157	161	7.00	7.55
Los Angeles *B2*						7.85	
Kansas City *S2*	142	158		167	164	7.15	7.90
Minnequa *C6*	142	151	155	160	164	7.15	7.55
Monessen *P6*	137	151			163	6.90	7.45
Moline, Ill. *R3*			155				
Pittsburg, Cal. *C7*	156	172		179	182	7.85	8.40
Portsmouth *P7*						6.90	7.90
Rankin, Pa. *A5*	137	149			162	6.90	7.45
So. Chicago *R3*	137	146	150		159	6.90	7.30
S. San Francisco *C6*					179		
Sparrows Pt. *B3*	139			157	164	7.00	7.55
Struthers, O. *Y1*						6.90	7.55
Worcester *A5*	143					7.20	
Williamsport, Pa. *S5*			150				

Cut Nails, carloads, base $8.30 per keg at Conshohocken, Pa. (*A2*). Galvanized products computed with zinc at 11.0¢ per lb. Exceptions: Alabama City and So. Chicago computed with zinc at 5¢; Chicago, zinc 12¢.

WARE-HOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Baltimore	$.20	6.02	7.51	7.79-7.89	6.69	.....	6.37	6.72	6.65	6.02	12.94	12.54	15.34	15.19
Birmingham	.15	6.35-6.50	7.35-8.10	8.25-9.00	6.60	8.85	6.65	6.65	6.50	8.85	.....	16.80	.....	19.80
Boston	.10	7.23	8.23-8.78	9.57	7.47	9.75	7.37	7.49	7.29	8.60	12.85-13.00	12.60	15.40	15.25
Buffalo	.25	6.30	7.40	8.84	6.65	7.62	6.60	6.67	6.45	7.40	12.70	12.15-12.30	15.10	14.95
Chicago	.20	6.38	7.38	8.30	6.62	.....	6.52	6.69	6.51	7.25	12.25	12.03	14.60	14.70
Cincinnati	.20	6.49-6.53	7.37-7.42	8.25-8.30	6.86-6.91	.....	6.81-6.86	6.86	6.75-6.80	7.55	12.55	12.30	14.90	14.95
Cleveland	.20	6.38	7.35	8.25	6.72	.....	6.69	7.02	6.57	7.35	11.96	12.11	.....	14.76
Denver		8.15	9.80-10.05	10.72	8.40	.....	8.10	8.15	8.30	9.92	.....	.....	.....	17.12
Detroit	.20	6.57	7.57	8.58	6.90	7.25	6.60	7.16	6.79	7.54	12.65	12.25	15.05	14.90
Houston		7.35	7.80	9.93-9.99	7.70	.....	7.35	7.60	7.70	9.30-9.40	.....	13.25	.....	.....
Kansas City	.10	7.05	8.05	8.97	7.29	.....	7.19-7.39	7.36	7.18	8.02	13.12	12.72	15.52	16.72
Los Angeles	.10	7.50	9.35	9.95	7.85	.....	7.45	7.65	7.45-7.55	10.15*	.....	13.45	.....	16.60
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	8.65	.....	.....	.....	.....
Milwaukee	.20	6.47	7.47	8.21-8.39	6.71	.....	6.61	6.86	6.69	7.44	12.34	12.14	14.69	14.79
New Orleans	.15	6.70	7.65	9.23	6.80	.....	6.90	7.05	6.80	8.60-10.70	.....	.....	.....	.....
New York	.10	6.97-7.07	7.91-8.56	8.79-8.94	7.56-7.66	10.15	7.27-7.37	7.38-7.48	7.37-7.47	8.73-8.83	12.63	12.43	.....	15.01
Norfolk	.20	7.00	.....	.....	7.10	.....	7.10	7.10	7.10	8.60	.....	.....	.....	.....
Philadelphia	.10	6.19	7.44	8.26*	6.96	.....	6.69	6.54	6.74	7.86	12.61-12.76	12.26-12.36	15.06-15.16	14.99-15.01
Pittsburgh	.20	6.38	7.38	8.30	6.72	.....	6.52	6.69	6.51	7.35	12.45	12.05	14.85	14.70
Portland	.20	7.00-7.80	7.75	9.10	7.05-7.25	.....	6.85	7.00	7.05	10.20-11.70	.....	.....	.....	.....
Salt Lake City	.20	7.65	10.20	10.70	9.05	.....	7.70	7.70-8.85	8.80	10.95	.....	.....	.....	.....
San Francisco	.10-.20	7.50-7.55	8.90-8.95	9.40-9.45	7.75-7.80	.....	7.35-7.40	7.45-7.50	7.30-7.35	10.00-10.05	.....	13.30-13.35	.....	16.45-16.50
Seattle	.00	8.10	9.80	10.15	8.20	.....	7.80	7.75	7.80	10.95	.....	13.80	.....	16.45
St. Louis	.20	6.67	7.67	8.59-8.84	6.91	.....	6.81	7.09	6.80	7.64	12.74	10.44	14.94	12.79
St. Paul	.20	7.04	8.04	8.96	7.20	.....	7.18	7.35	7.17	8.01	.....	12.71	.....	15.36

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.
* Plus analysis charge.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Buffalo, N. Y. *R7*	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. *S9*		8.05	9.00	11.15	13.85
Cleveland *A5*	5.75	8.05	9.00	11.15	13.85
Detroit *D1*	5.85	8.25	9.20	10.95	.....
Detroit *D2*	5.85	8.25	9.20	.....	.....
Harrison, N. J. *C11*	.....	.....	9.30	11.45	14.15
Indianapolis *C5*	6.00	8.20	9.00	11.15	13.85
New Castle, Pa. *B4*	5.75	8.05	9.00	10.95	.....
New Haven, Conn. *D1*	6.20	8.35	9.30	11.25	.....
Pawtucket, R. I. *N7*	6.30	8.35	9.30	11.45	14.15
Pittsburgh *S7*	5.75	8.05	9.00	.....	.....
Riverdale, Ill. *A1*	5.85	8.05	9.00	11.15	13.85
Sharon, Pa. *S1*	5.75	8.05	9.00	11.15	13.85
Trenton *R4*	.....	8.35	9.30	11.25	13.40
Wallingford *W1*	6.20	8.35	9.30	11.45	14.15
Warren, Ohio *T4*	5.75	8.05	9.00	11.15	13.85
Weirton, W. Va. *W3*	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. *A5*	6.60	8.35	9.30	11.45	14.15
Youngstown *C5*	5.85	8.05	9.00	11.15	13.85

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	28.33	33.97	27.48	32.95
	2½	12	38.15	45.74	37.00	44.36
	3	12	44.05	52.82	42.72	51.23
	3½	11	51.43	61.66	49.88	59.81
	4	10	68.29	81.88	66.24	79.42
National Tube	2	13	28.33	33.97	27.48	.....
	2½	12	38.15	45.74	37.00	.....
	3	12	44.05	52.82	42.72	.....
	3½	11	51.43	61.66	49.88	.....
	4	10	68.29	81.88	66.24	.....
Pittsburgh Steel	2	13	28.33	33.97	.....	.....
	2½	12	38.15	45.74	.....	.....
	3	12	44.05	52.82	.....	.....
	3½	11	51.43	61.66	.....	.....
	4	10	68.29	81.88	.....	.....

Miscellaneous Prices

(Effective June 28, 1955)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.54
18	4	1	—	5	2.245
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.29

High-carbon chromium ..... .73
Oil hardened manganese ..... .405
Special carbon ..... .37
Extra carbon ..... .31
Regular carbon ..... .26

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Base prices, cents per lb, f.o.b.

		Plate (*A3, J2, L4*)			Sheet (*I2*)
	Cladding	10 pct	15 pct	20 pct	20 pct
Stainless Type	304	28.30	30.95	33.60	29.75
	316	33.40	36.10	38.80	42.75
	321	30.00	32.65	35.30	34.25
	347	32.20	35.40	38.60	44.25
	405	23.00	27.50	31.10	.....
	410, 430	23.40	27.00	30.60	.....

CR Strip (*S9*) Copper 10 pct 2 sides 33.00 1 side 26.00

LAKE SUPERIOR ORES

51.50% *Fe; natural content, delivered lower Lake ports. Prices effective for* 1955 *season.*

	Gross Ton
Openhearth lump	$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$13.00 to $13.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.50
Philadelphia, f.o.b.	24.00
Swedeland, Pa., f.o.b.	24.00
Plainesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	22.00	40	110	10.80
20	72	21.25	40	100, 110	9.80
18 to 16	72	21.50	35	110	9.80
14	72	22.00	30	110	9.80
12	72	22.25	24	72 to 84	9.85
8 to 10	60	22.75	20	90	9.85
7	60	23.00	17	72	9.85
6	60	25.00	14	72	10.25
4	40	26.50	10, 12	60	11.10
3	40	30.00	8	60	11.40
2½	30	30.75			
2	24	47.75			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	Discount C.
½ in. & smaller x 4 in. & shorter	2	22
½ in. & smaller x 6 in. & shorter	+3	18
9/16 in. & ⅝ in. x 6 in. & shorter	+4	17
⅝ in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in.	+15	8
½ in. & smaller x 6 in. & shorter	+3	18
Lag, all diam. x 6 in. & shorter	6	25
Lag, all diam. longer than 6 in.	+2	19
Plow bolts	23	23

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
¾" or smaller	55	64
⅞" to 1⅛" inclusive	58	66
1¼" to 1½" inclusive	60	67½

C.P. Hex. regular & hvy.

All sizes	55	64

Hot Galv Nuts (all types)

¾" or smaller	38	50
⅞" to 1½" inclusive	41	52½

Finished, Semi-finished, Slotted or Castellated Nuts

All sizes	55	66

Rivets

	Base per 100 lb
½ in. & larger	$9.25
	Pct Off List
7/16 in. and smaller	37

Cap Screws

	Discount Bright	Discount H.C. Heat Treated
New std. hex head, packaged ⅜" x 6" and smaller and shorter	38	28
¾", ⅞", 1" x 6" and shorter	15	1
New std. hex head, bulk* 5" x 6" and smaller and shorter	50	42
¾", ⅞", 1" x 6" and shorter	32	21

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

		Discount Mach. Screws	Discount Stove Bolts
Packaged, package list		33	43
Bulk, bulk list			
	Quantity		
¼-in. diam. & under	15,000- 99,999	17	59
	100,000-199,999	25	63
	200,000 & over	33	67
5/16-in. diam. & larger	15,000- 49,999	17	59
	50,000- 99,999	25	63
	100,000 & over	33	67
All diam. over 3 in. long	5,000- 49,999	..	59
	50,000- 99,999	..	63
	100,000 & over	..	67

Machine Screw & Stove Bolt Nuts

		Discount Hex	Discount Square
Packaged, package list		30	33
Bulk, bulk list			
	Quantity		
⅜-in. diam. & smaller	15,000- 99,999	15	17
	100,000-199,999	23	25
	200,000 & over	31	33

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$114.00
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$120.00
Childs, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	.....
California	.....
Super Duty Hays, Pa., Athens, Tex., Windham	137.00
Curtner, Calif.	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	30.00
Silica cement, net ton, bulk, Hays, Pa.	22.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	.....

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite

St. ⅝-in., grains

Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	38.00
in sacks	43.75

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$14.50
Midwest	15.10
Missouri Valley	13.65

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 *mesh.*

Swedish sponge iron c.i.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East, carloads	9.5¢ / 10.75¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe	83.0¢ to $1.43
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	51.50¢
Copper, reduced	51.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$4.05
Zinc, 10 ton lots	17.5¢ to 25.0¢

Ferroalloy Prices

(Effective June 28, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.

0.025% C	36.00	0.15% C	33.75
0.025% C, Simplex	34.50	0.20% C	33.50
		0.50% C	33.25
0.06% C	34.50	1.00% C	33.00
0.10% C	34.00	2.00% C	32.75

65-69% Cr, 4-9% C 24.75
62-66% Cr, 4-6% C, 6.9% Si 25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.16
9 to 11% C	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	16.60
Ton lots	18.10
Less ton lots	19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	11.85
Ton lots packed	13.45

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	33.85	35.05
0.07% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.00
Ton lots	12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet	12.45
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $88.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.55
Ton lots	8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.40
50% Si	12.00	85% Si	16.10
65% Si	13.50	90% Si	17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.30- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	9.25¢
Ton lots	10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$12.00
Less ton lots	12.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta $6.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ½ x down, packed, per pound contained W, ton lots, f.o.b. $3.80

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.27
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots, lump, packed	17.25¢

Vanadium Pentoxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, contract basis, per lb of alloy.

35-40%, f.o.b. freight allowed, ton lots	26.00¢
12-15%, del'd, lump, bulk-carloads	8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si, 40-45%, per lb contained 2.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 16-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.20
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.00
No. 6	63¢
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 2.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.05

Silcas, contract basis, delivered.

Ton lots ..... 45.00¢

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EC&M TAB-WELD Plate Resistors are easy to select and use for controller, starter or similar service. There are several standard mill sections to choose from and each section has many convenient tap-plates. This allows quick clamping to external connections and gives a choice of adjustments. When necessary for high capacity, sections can be easily paralleled externally. These same advantages reduce down-time when old existing sections are replaced with TAB-WELD Resistors.

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These EC&M Resistors are non-breakable and are made from corrosion-resistant steel. WELDING joins offset grid ends to assure a continuous current-carrying path. WELDING also stabilizes ohmic value independent of the clamping-nut pressure and stops burning at grid-eyes and tap-plates. Terminal-plates, also WELDED in place, simplify tap connections . . . tap-shifting.

MAXIMUM ECONOMY

EC&M TAB-WELD Plate Resistors cut costs and save manpower. Ease of selection and application reduce engineering time. Installation is quick and maintenance is practically nil . . . there's no need for periodic tightening of clamping nuts. EC&M TAB-WELD Plate Resistors are easy to specify because they are built in only one style . . . WELDED for top performance.

Write for informative Bulletin 942-B

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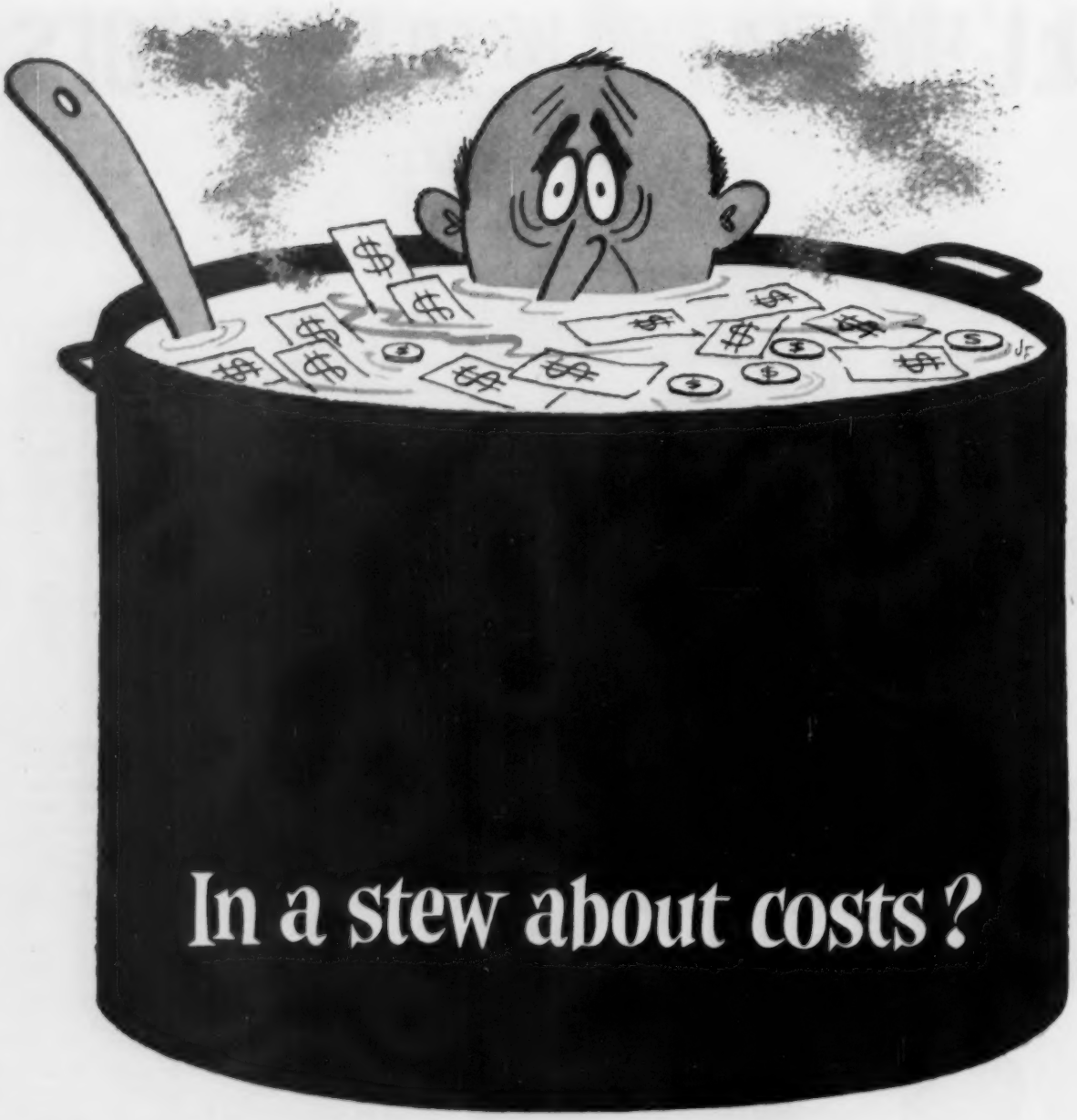

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News of Used and Rebuilt Machinery

Detroit Spurt Ends . . . There was a spurt of business in the used machinery business in the Detroit area which lasted about 6 weeks but things have settled down to a steady pace now and dealers expect it to stay that way until fall.

Settlement of the auto labor situation is expected to have a definite effect here on smaller tool and die shops. Most dealers believe that these shops were holding back while negotiations were in progress but that they will become more active soon.

Larger shops in the area enjoyed the advantage of not having to worry about the labor picture and kept rolling right along. These places are concentrating on new equipment at this time, although in some cases a small amount of rebuilding is going on.

Hit Summer Lag . . . The overall picture for the machinery business right now is "steady to fair." As one dealer put it, "We are in the summer doldrums, but I think things will get better."

Tool room activity is already reported on the increase. Dealers take this as an indication that some of the small auto suppliers are getting ready for the 1956 model cars. The demand for good, used tool room equipment is expected to pick up sooner than other lines here.

Old Units Sit . . . Meantime, several calls are reported for boring and drilling machines, surface grinders, lathes, mills and planers. But dealers can't find a home for older equipment. Hottest item in Detroit right now is presses. Used machinery people say most of these are going for die tryouts. Inquiries for both medium and heavy presses are strong and dealers are also taking this as a sign that everybody in Detroit is starting to think about getting ready for new model cars. There is no scarcity of equipment, particularly in older lines and, from time to time, a real old machine is scrapped. Right now, supply and demand for the newer types of equipment are pretty much in balance.

Hardest item to move is still welding equipment and some types of heavy lathes. But once the seasonal slump is over, dealers look for a brisk pickup in all lines.

East Does Well . . . Business is generally good in New York and lower New England with heavy fabricating equipment doing particularly well.

Heavy presses, brakes and shears are all moving briskly and sales offering these items are attracting crowds of dealers. A $2.5 million sale of surplus aircraft production equipment drew over 100 dealers. And they were buying.

Some of the purchases may have been for inventory rebuilding but the prices paid and the keen bidding indicated there was a home waiting for most units.

Want Late Models . . . Obtaining good, late-model equipment is a problem as always. As one dealer put it: "When you turn up a good machine, there are a dozen other fellows chasing after it too." But model changes in a number of industries are loosening up supply and several million-dollar sales are on deck.

Current trend in the East is toward volume production and heavy production tools, with the smaller shops losing out. This is causing some slackness in general metalworking tools.

A major dealer in this type equipment expressed concern at the development and said business was off a little. However, he spoke calmly of the lag, attributing it partly to seasonal factors. Many plants are trying to get as much production as possible before vacations hit and are holding off equipment change-overs.

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1¾ x 1¾ x ¾" Niagara No. 3 Angle Bending Roll Motor Driven Incl. Motor, NEW 1945
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12' All Steel Press Brake, 250 ton Capacity
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Clyde Double Drum Electric Car Puller, Capacity 43,750# Max. Starting Pull

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5 ton Northern	57' Span 220/3/60 A.C.
5 ton Toledo	60' Span 230 Volt D.C.
5 ton Cleveland	96' Span 230 Volt D.C.
7½ ton Shepard-Niles	22' Span 220/3/60 A.C.
10 ton P&H	35' Span 230 Volt D.C.
10 ton Shaw	72' Span 230 Volt D.C.
10 ton Northern	75' Span 230 Volt D.C.
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25 ton Henry & Wright, 1¼" Stroke, Double Roll Feed, Scrap Shear

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1", 2½", 3", 3½", 4", 5" Ajax
5" National 7½" National—Air Clutch

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1" Kling No. 100, 48" Throat, Joggling Rolls Incl.

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Model A32 Reed Thread Roller, Horizontal, Capacity Approx. Work Dia. In-feed, Standard Equip. 1" to 4"

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1	1200	G.E.	MCF	600	750/950
1	1000	G.E.	MCF	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		250	450/550
1	600	Al. Ch.		250	400/800
1	500	Whse.	DC-214	600	300/900
1	500	G.E.	MCF	250	300/900
8	450	Whse.		550	415
1	350	Whse.		250	340/900
1	250	G.E.	MPC	230	400/600
1	200	Rel.	1970T	230	720
8	200	G.E.	CD-1650Z	230	500/1500
1	200	Whse.	CB-5113	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	45H	230	1150
8	150	Cr. Wh.	45H-TEFC	230	880
1	150	Whse.	8K-1515	230	900/1800
1	150	Whse.	8K-201	230	360/950
1	120	G.E.	MCF	230	250/1000
1	125	Whse.	8K-141	230	500/1500
1	125	Whse.	8K-183	230	850
1	125	G.E.	MDS-418	230	415

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	1750/2100	G.E.	514	250/300	2300/4600
1	2000	G.E.	500 25cg	660	11000
1	2000	G.E.	514	600	6600/13200
1	2000	G.E.	450	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	C.W.	514	90/115	4600/13000
2	1000	G.E.	720	600	2300/4600
2	750	G.E.	720	275	2300/4600
1	750	C.W.	514	90/115	2300
1	600	G.E.	720	250	440/2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
2	4200	G.E.	FOWT	3	13500x115/205
1	3000	Wagner	HPW-20	3	2400x2400
3	2000	G.E.	HVDDJ	1	66000x13800
3	1600	G.E.	HVDDJ	1	2400x480
6	1000	Wagner	OISC	1	13200x480
9	667	G.E.	HD	1	13800x2300

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Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U type.

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72" Hanchett 3-spd. rotary surface, new 1946.
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16" x 96" Landis gap type cylindrical, new 1941.

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15" x 30" Lipe Carbo-Matic, 1942.
9" x 18" Hendey Prec., Tool & Gauge, 1940.

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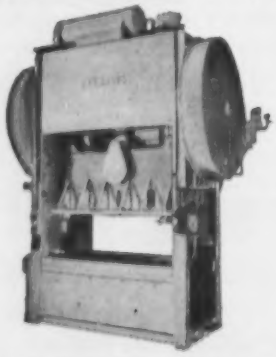

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1	1200/1800	G.E.	MT-498	2300	357
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1	600	G.E.	MT	2300	585
1	600	Whse.	C.W.	2300	444
1	600	G.E.	MT-29	2300	360
1	500	Al. Ch.	ANY	2200	585
3	500	G.E.	I-M	2300	450
3	400	G.E.	I-17-M	2300	875
1	400	G.E.	MT-434	440	360
1	400	Al. Ch.	ANY	2300	585
1	400	G.E.	MT-412	2300	440
1	300	G.E.	I-17-M	2300	580
1	250	G.E.	M-6385-B	2300	1200
1	250	Whse.	CW-907	440	1200
1	250	Al. Ch.	ANY	440	705
1	250	Whse.	CW	2300	450
1	250	G.E.	MT-414	2300	900
1	200	Whse.	CW	440	600
1	150	Al. Ch.	ANY	440	705
1	150	Al. Ch.	ANY	2300	600
2	150	G.E.	I-17-M	440	450
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1	1750	G.E.	100	2300	360
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1	1000	Whse.	80	2300	225
1	800	El. Mchy.	80	440	1200
1	750	G.E.	80	2300	450
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1	710	G.E.	80	2300	720
1	250	G.E.	80	440	450
1	250	G.E.	100	2300	514
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1	150	G.E.	100	2300	900
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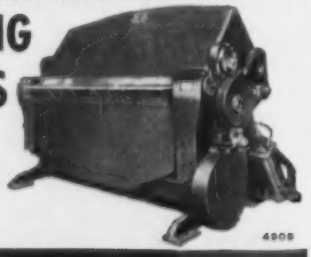

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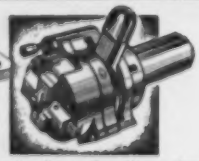

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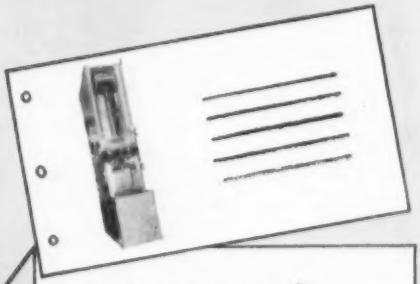

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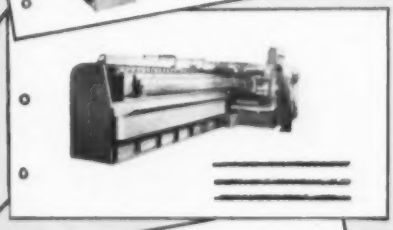

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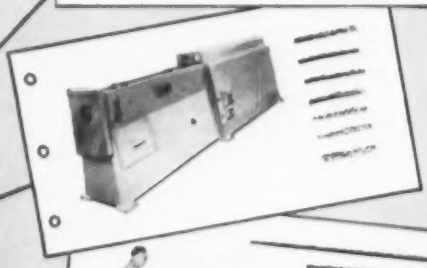
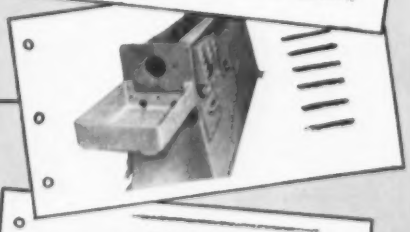


See the SPECIAL

72" Horizontal Electric Drive machine: the first of its kind for internal or external broaching. This machine is broaching involute gear sprockets, a surface broaching operation on sprocket, with 25 teeth, at rate of 25 complete parts per hour.

See the CONTINUOUS

Broaching machine: broaching automotive connecting rods at the rate of 1200 parts per hour, using 24 fixtures per machine.



See the HP-10

"Toolroom" broaching machine: broaching standard keyways in gears. (A small, universal machine, 48" stroke.)

See the SHARPENER

with micro-feed attachment sharpening and backing off all types of broaches. 36" size, with high speed spindle.

* The fastest broaching operation ever performed . . . finish-broaching more than 235 "pine tree" slots per hour!

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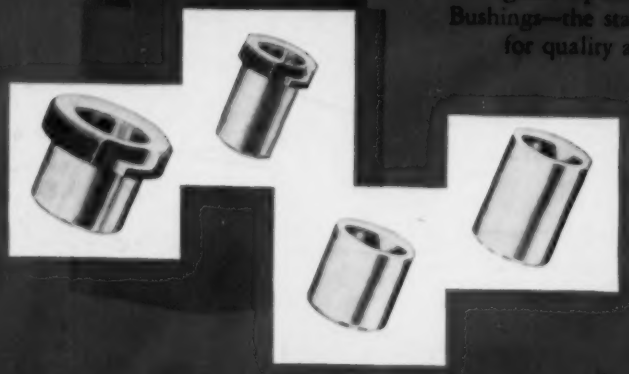
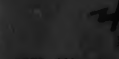


LOOK FOR THE TRADE MARK



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